

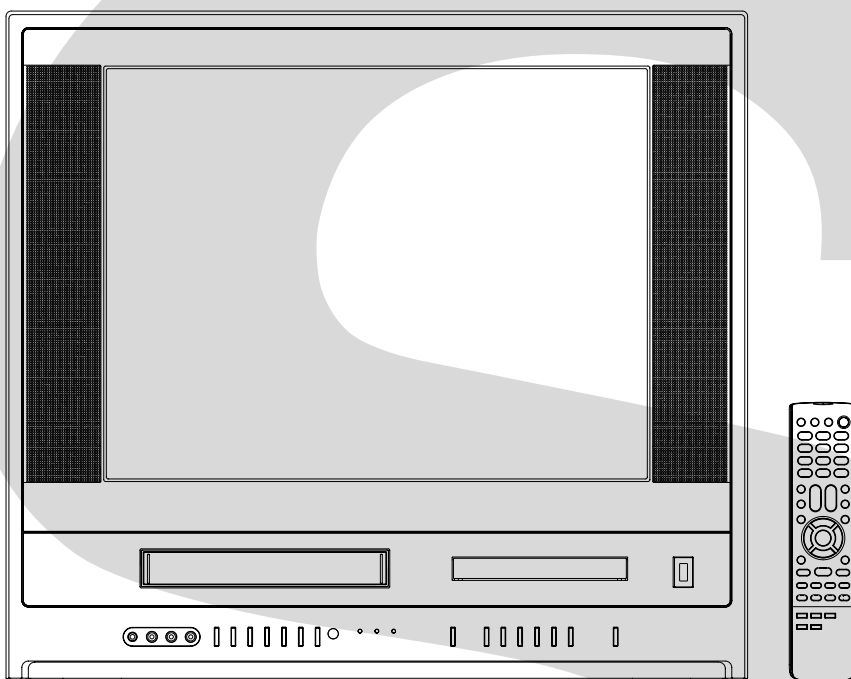
TOSHIBA

FILE NO. 140-200607GR
(MFR'S VERSION A)

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER/ DVD VIDEO PLAYER

MW20F52



The above model is classified as a green product (*1), as indicated by the underlined serial number. This Service Manual describes replacement parts for the green product. When repairing this green product, use the part(s) described in this manual and lead-free solder (*2).

For (*1) and (*2), see the next page.

DOCUMENT CREATED IN JAPAN, March, 2006 GREEN

(*1)

GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing the restricted substances.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2)

LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT !

The melting temperature of lead-free solder is higher than that of leaded solder by 86°F to 104°F (30°C to 40°C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or PCB being soldered. Great care should be made to ensure high-quality soldering when servicing this product — especially when soldering large components, through-hole pins, and on PCBs — as the level of heat required to melt lead-free solder is high.

CAUTION

THIS DIGITAL VIDEO PLAYER EMPLOYS A LASER SYSTEM.

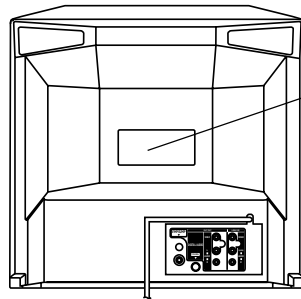
TO ENSURE PROPER USE OF THIS PRODUCT, PLEASE READ THIS SERVICE MANUAL CAREFULLY AND RETAIN FOR FUTURE REFERENCE. SHOULD THE UNIT REQUIRE MAINTENANCE, CONTACT AN AUTHORIZED SERVICE LOCATION-SEE SERVICE PROCEDURE.

USE OF CONTROLS, ADJUSTMENTS OR THE PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

TO PREVENT DIRECT EXPOSURE TO LASER BEAM, DO NOT TRY TO OPEN THE ENCLOSURE. VISIBLE LASER RADIATION MAY BE PRESENT WHEN THE ENCLOSURE IS OPENED. DO NOT STARE INTO BEAM.

Location of the required Marking

The rating sheet and the safety caution are on the rear of the unit.



CERTIFICATION: COMPLIES WITH FDA
RADIATION PERFORMANCE STANDARDS,
21 CFR SUBCHAPTER J.

PREPARATION OF SERVICING

The laser diode used for a pickup head may be destroyed with external static electricity.

Moreover, even if it is operating normally after repair, when static electricity discharge is received at the time of repair, the life of the product may be shortened.

Please perform the following measure against static electricity, be careful of destruction of a laser diode at the time of repair.

- Place the unit on a workstation equipped to protect against static electricity, such as conductive mat.
- Soldering iron with ground wire or ceramic type is used.
- A worker needs to use a ground conductive wrist strap for body.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT SAFEGUARDS

1. READ INSTRUCTIONS

All the safety and operating instructions should be read before the unit is operated.

2. RETAIN INSTRUCTIONS

The safety and operating instructions should be retained for future reference.

3. HEED WARNINGS

All warnings on the unit and in the operating instructions should be adhered to.

4. FOLLOW INSTRUCTIONS

All operating and use instructions should be followed.

5. CLEANING

Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6. ATTACHMENTS

Do not use attachments not recommended by the unit's manufacturer as they may cause hazards.

7. WATER AND MOISTURE

Do not use this unit near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

8. ACCESSORIES

Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury, and serious damage to the unit. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer.

- 8A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9. VENTILATION

Slots and openings in the cabinet and in the back or bottom are provided for ventilation, to ensure reliable operation of the unit, and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the unit on a bed, sofa, rug, or other similar surface. This unit should never be placed near or over a radiator or heat source. This unit should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

10. POWER SOURCES

This unit should be operated only from the type of power source indicated on the rating plate. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.

11. GROUNDING OR POLARIZATION

This unit is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. If your unit is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin, this plug will only fit into a grounding-type power outlet. This too, is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12. POWER-CORD PROTECTION

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

13. LIGHTNING

To protect your unit from a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

14. POWER LINES

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.

15. OVERLOADING

Do not overload wall outlets and extension cords, as this can result in a risk of fire or electric shock.

16. OBJECT AND LIQUID ENTRY

Do not push objects through any openings in this unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill or spray any type of liquid into the unit.

PORTABLE CART WARNING
(symbol provided by RETAC)



S3126A

17. OUTDOOR ANTENNA GROUNDING

If an outside antenna or cable system is connected to the unit, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

18. SERVICING

Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19. DAMAGE REQUIRING SERVICE

Unplug this unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the unit.
- c. If the unit has been exposed to rain or water.
- d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
- e. If the unit has been dropped or the cabinet has been damaged.
- f. When the unit exhibits a distinct change in performance, this indicates a need for service.

20. REPLACEMENT PARTS

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or those that have the same characteristics as the original parts.

Unauthorized substitutions may result in fire, electric shock or other hazards.

21. SAFETY CHECK

Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

22. WALL OR CEILING MOUNTING

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

23. HEAT

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

24. DISC TRAY

Keep your fingers well clear of the disc tray as it is closing. It may cause serious personal injury.

25. CONNECTING

When you connect the product to other equipment, turn off the power and unplug all of the equipment from the wall outlet. Failure to do so may cause an electric shock and serious personal injury. Read the owner's manual of the other equipment carefully and follow the instructions when making any connections.

26. SOUND VOLUME

Reduce the volume to the minimum level before you turn on the product. Otherwise, sudden high volume sound may cause hearing or speaker damage.

27. SOUND DISTORTION

Do not allow the product output distorted sound for a longtime. It may cause speaker overheating and fire.

28. HEADPHONES

When you use the headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

29. LASER BEAM

Do not look into the opening of the disc tray or ventilation opening of the product to see the source of the laser beam. It may cause sight damage.

30. DISC

Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.

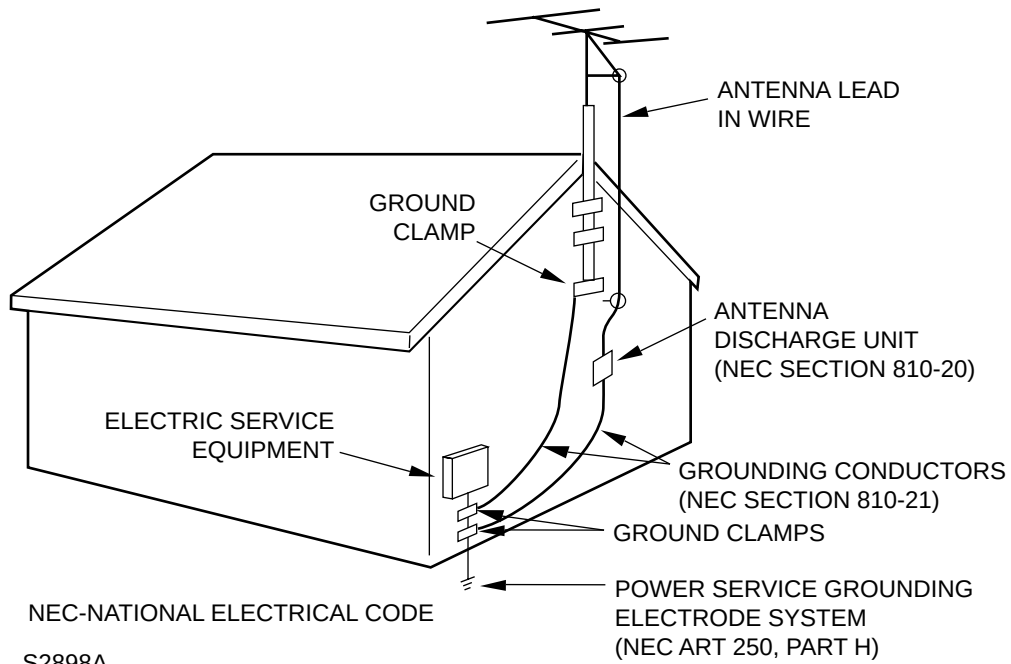
31. NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

IMPORTANT SAFEGUARDS

(CONTINUED)

EXAMPLE OF ANTENNA GROUNDING AS PER THE NATIONAL ELECTRICAL CODE



WHEN REPLACING DVD DECK

[When removing the DVD Deck]

Before removing Pick Up PCB and DVD PCB connector, the short circuit the position shown in **Fig. 1** using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.

[When installing the DVD Deck]

Remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

NOTE

- Before your operation, please read "PREPARATION OF SERVICING".
- Use the Lead Free solder.
- Manual soldering conditions
 - Soldering temperature: $350 \pm 5^{\circ}\text{C}$
 - Soldering time: Within 2 seconds
 - Soldering combination: Sn-3.0Ag-0.5Cu
- When Soldering/Removing of solder, use the draw in equipment over the Pick Up Unit to keep the Flux smoke away from it.

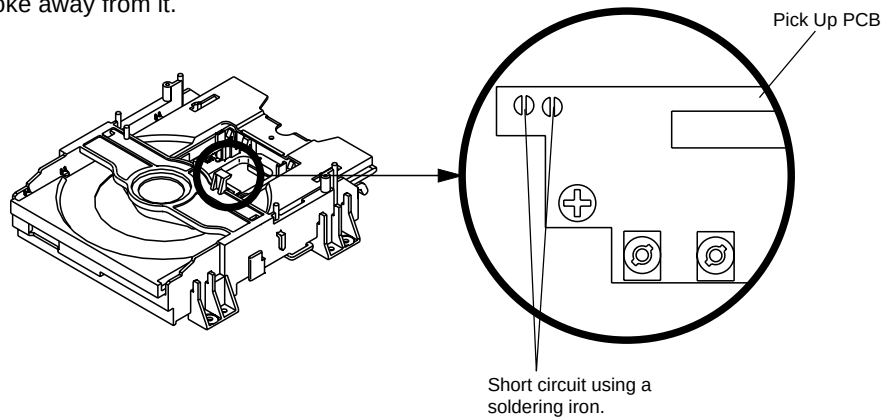


Fig. 1

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the TV/DVD/VCR block from the main unit as shown in **Fig. 1** below can be seen.
(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)
2. Remove the screw ① of the Deck Chassis and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.
(Refer to Fig. 2)
4. Rotate the Clutch Ass'y either direction to wind the Video Tape in the Cassette Case.
5. Repeat steps 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch the tape.

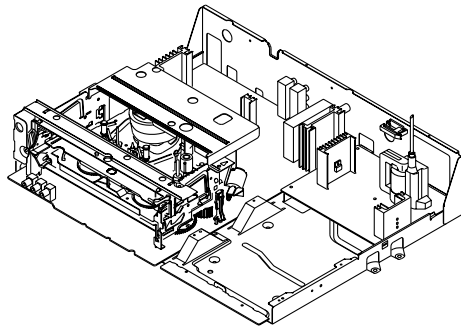


Fig. 1

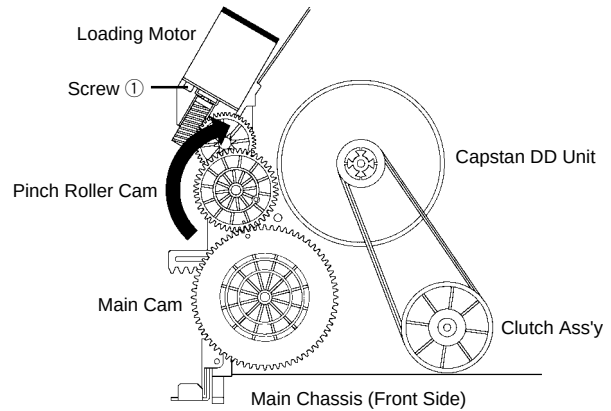


Fig. 2

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Back Cabinet and AV PCB/DVD Block. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Rotate the Main Gear in the direction of the arrow by hand.
(Refer to Fig. 1)
3. Manually open the Tray.

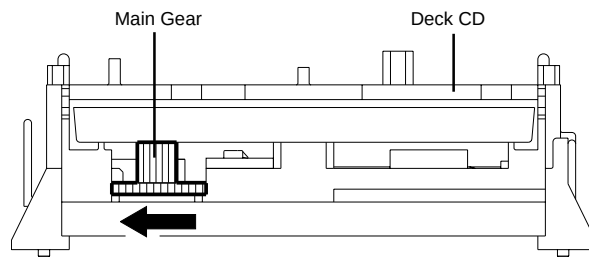


Fig. 1

PARENTAL CONTROL - RATING LEVEL 4 DIGIT PASSWORD CANCELLATION

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD Mode.
3. Confirm that the 'No Disc' will be appeared on the screen.
4. Press and hold the '7' key on the remote control unit.
5. Simultaneously press and hold the 'STOP' key on the front panel.
6. Hold both keys for more than 3 seconds.
7. The On Screen Display message 'PASSWORD CLEAR' will appear.
8. The 4 digit password has now been cleared

TRAY LOCK

Tray cannot be opened by setting the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO SELECT' and '0' key of a remote control unit.
4. The On Screen Display message '  ' will appear.
5. The Tray Lock has now been set up.

To unlock the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO SELECT' and '0' key of a remote control unit.
4. The On Screen Display message '  ' will appear.
5. The Tray Lock has now been cleared.

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GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	20 inch / 508.0mmV
			CRT Type	Flat
			Magnetic Field BV/BH	+0.45G / 0.18G
		Color System		NTSC
		Speaker		2 Speaker
			Position	Front
			Size	1.8 x 3.9 Inch
			Impedance	8 ohm
		Sound Output	MAX	2.5W + 2.5W
			10%(Typical)	
G-2	VCR System	System		VHS Player / Recorder
		Video System		NTSC
		Hi-Fi STEREO		Yes
		NTSC PB		-
		Deck		OVD-7
		Heads	Video Head	4 Heads
			FM Audio Head	2 Heads
			Audio /Control	Mono /Yes
			Erase(Full Track Erase)	Yes
			Erase (Normal Audio Track Erase)	Yes
		Tape Rec	PAL	-
		Speed	NTSC	SP/SLP(EP)
			Play PAL	-
			NTSC	SP/SLP(EP)
		Fast Forward / Rewind Time (Approx.) at 25oC		FF:1'48"/REW:1'48"
			with Cassette	T-120
G-3	DVD System	Color System		NTSC
		Disc		DVD, CD-DA, CD-R/RW, Video CD DVD-R/RW (Video Format Only)
		Disc Diameter		120 mm , 80 mm
		Drive		DM3SA
		Search speed	Fwd	4 step
			Actual	2-120 times(DVD, VIDEO CD) 4-40 times (CD)
			Rev	4 step
			Actual	2-120 times(DVD, VIDEO CD) 4-40 times (CD)
		Slow speed		Fwd 1/7 - 1/2 times
			Actual	--
				Rev --
			Actual	--
G-4	Tuning System	Broadcasting System		US System M
		Tuner and	System	1 Tuner
		Receive CH	Destination	US(w/CABLE)
			CH Coverage	2~69, 4A, A-5~A-1, A~I, J~W, W+1~W+84
		Intermediate	Picture(FP)	45.75MHz
		Frequency	Sound(FS)	41.25MHz
			FP-FS	4.5MHz
		Preset CH		No
		Stereo/Dual TV Sound		US-Stereo
		Tuner Sound Muting		Yes

GENERAL SPECIFICATIONS

G-5	Signal	Video Signal	Input Level	1 V p-p/75 ohm		
			Output Level	1 V p-p/75 ohm		
			S/N Ratio (Weighted) at DVD Mode	65dB		
			S/N Ratio (Weighted) at VCR Mode	50dB		
			Horizontal Resolution at DVD Mode	400 Lines		
			Horizontal Resolution at VCR(SP)Mode	220 Lines		
		RGB Signal	Output Level	-		
		Audio Signal	VCR DVD	Input Level	-8.0dBm/50k ohm	
				Output Level(0dB=0.775Vrms)	-8.0dBm/1k ohm	
				Output Level(-20dBfs 0dBfs=2.0Vrms)	-12.0dBm/1k ohm	
				Digital Output Level	0.5 V p-p/75 ohm(DVD)	
				S/N Ratio at DVD (Weighted)	90 dB	
				S/N Ratio at VCR (SP)(CCIR Filter:ON)	38 dB	
				Harmonic Distortion at DVD Mode	0.06% (1kHz)	
				Harmonic Distortion at VCR(SP) Mode	1.5% (1kHz) Typical	
				Frequency Response :		
				DVD Mode	at DVD	4Hz - 22kHz
				at Video CD	4Hz - 20kHz	
				at SVCD	-	
				at CD	4Hz - 20kHz	
				VCR Mode	at SP	100Hz - 10kHz
				at LP	-	
				at SLP	100Hz - 4kHz	
				Hi-Fi Audio Signal	Dynamic Range : More than	90 dB
		Frequency Response :	20Hz - 20kHz			
		Wow And Flutter : Less than	0.01 %Wrms			
		Channel Separation : More than	60 dB			
		Harmonic Distortion : Less than	1.0 %			
		G-6	Power	Power Source	AC	120V,60Hz
DC	-					
Power Consumption	at AC			110 W at 120 V 60 Hz		
	at DC			-		
	Stand by (at AC)			4 W at 120 V 60 Hz		
Protector	Per Year			-		
	Energy Star			No		
	Power Fuse			Yes		
G-7	Regulation	Safety	UL			
		Radiation	FCC			
		X-Radiation	DHHS			
		Laser	DHHS			
G-8	Temperature	Operation	+5oC ~ +40oC			
		Storage	-20oC ~ +60oC			
G-9	Operating Humidity		Less than 80% RH			
G-10	OSD Language		English French Spanish			
G-11	Clock,Timer and Timer Back-up	Calendar	1990/1/1 ~ 2081/12/31			
		Timer Events	8 Program/ 1 Month			
		One Touch Recording Max Time	6 Hours			
		Sleep Timer	Max Time	120 Min		
		Step	10 Min			
		On/Off Timer	Program(On Timer / Off Timer)	1 Program		
		Auto Shut Off	No Signal	15 Min		
		No Operation	-	Min		
		Timer Back-up (at Power Off Mode)	5	Sec		

GENERAL SPECIFICATIONS

G-12	Remote Control Unit	Unit	RC-KH
		Glow in Dark Remocon	No
		Remocon Format	TOSHIBA
		Format	TOSHIBA
		Custom Code	40-BFh, 44-BBh, 45-Bah
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	49 Key
		Keys	
		TV/VCR	Yes
		DVD	Yes
		Power	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		Channel-	Yes
		Channel+	Yes
		Volume-	Yes
		Volume+	Yes
		Display	Yes
		Sleep	Yes
		Audio Select	Yes
		Mute	Yes
		Channel Return / Skip-	Yes
		Closed Caption / Skip+	Yes
		TIMER REC	Yes
		Rec/OTR	Yes
		Slow+	Yes
		Play	Yes
		Stop	Yes
		REV(Rew)	Yes
		FF(F. Fwd)	Yes
		Pause / Still	Yes
		CM Skip / Jump	Yes
		Speed / Return	Yes
		Counter Reset / Angle	Yes
		Zero Return / Subtitle	Yes
		Input Select / Zoom	Yes
		Menu /Setup	Yes
		Program / Repeat A-B / DVD/USB	Yes
		D.Tracking / Top Menu	Yes
		Tracking+ / DVD Menu	Yes
		Tracking- / Play Mode	Yes
		Cancel	Yes
		Cursor Up	Yes
		Cursor Down	Yes
		Cursor Left	Yes
		Cursor Right	Yes
		Enter	Yes
		Open/Close	Yes
		Eject	Yes

GENERAL SPECIFICATIONS

G-13	Features (TV/VCR)	Auto Clock	Yes	
		Auto Setup	Yes	
		Auto CH Memory	Yes	
		Closed Caption	Yes	
		TV Auto Shut off Function	Yes	
		CABLE	Yes	
		Comb Filter (2Lines)	Yes	
		VM Circuit		No
		Choke Coil		No
		SAP	Yes	
		Protect of FBT Leak Circuit	Yes	
		Power On Memory		No
		V-chip	Yes	
		USA V-chip		
		CANADA V-chip		No
		Favorite CH		No
		Auto Head Cleaning	Yes	
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		Forward / Reverse Picture Search	Yes	
		End Call		No
		Index Search		No
		SQPB		No
		CM Skip(30sec x 6 Times)	Yes	
		TV Monitor		No
		Program Extend		No
		Zero Return	Yes	
		Auto Repeat	Yes	
		Picture	Brightness/Contrast/Sharpness/Color	Yes
			Tint	Yes
			Picture Preference	Yes
		Audio	Tone Control (Bass/Treble/Balance)	Yes
			Stable Sound	Yes
			Surround	Yes
		Timer	On/Off Timer Set	Yes
			Auto Clock On/Off	Yes
			Sleep Time	Yes
			Standard Time	Yes
			Daylight Saving Time	Yes
		Tuning	Auto CH Memory	Yes
			ADD/Delete	Yes
	Features (DVD)	Tray Lock	Yes	
		Auto Stop	(Pause, and Resume Stop after 5min.)	Yes
		USB	(Some USB devices may not be usable.)	Yes
		Card Slot Reading	(Not secured Data)	No
		Video CD Playback		Yes
		SVCD Playback		No
		MP3 Playback		Yes
		WMA Playback		Yes
		JPEG Playback		Yes
		DivX Play back		Yes
			DMF Support	No
		Digital Out	(Dolby Digital)	Yes
			(MPEG)	Yes
			(PCM)	Yes
			(DTS)	Yes
		Down Mix Out	(Dolby Digital)	Yes
			(DTS)	No
		3D Surround		No
		Closed Caption Signal in VBI (DVD Playback)		No
		Screen Saver		No
		Audio DAC		192kHz / 24bit
		Copy (Disc to Tape)		Yes (by Conditioning)

GENERAL SPECIFICATIONS

G-14	Accessories	Owner's Manual		Language	English
				w/Guarantee Card	Yes
		Remote Control Unit			Yes
		Battery			Yes
				UM size x pcs	UM-4 x 2 pcs
				OEM Brand	No
		Rod Antenna			No
				Poles	-
				Terminal	-
		Loop Antenna			No
				Terminal	-
		U/V Mixer			No
		300 ohm to 75 ohm Antenna Adapter			Yes
		Antenna Change Plug			No
		DC Car Cord (Center+)			No
		AC Plug Adapter			No
		AC Cord			No
		AV Cord (2Pin-1Pin)			No
		Guarantee Card			No
		Registration Card			Yes
		ESP Card			No
		Warning Sheet			No
		Dew/AHC Caution Sheet			No
		Quick Set-up Sheet			No
		Circuit Diagram			No
		Service Facility List			No
		Important Safeguard			No
		Information Sheet (Return)			Yes
		Netflix Card			No
G-15	Interface	Switch	Front	Power (Tact)	Yes
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
				Play (VCR)	Yes
				Stop / Eject (VCR)	Yes
				F.FWD/Cue (VCR)	Yes
				Rew/Rev (VCR)	Yes
				REC/OTR (VCR)	Yes
				Play (DVD)	Yes
				Stop (DVD)	Yes
				Skip+ /Search+ (DVD)	Yes
				Skip- /Search- (DVD)	Yes
				Open/Close (DVD)	Yes
				Input Select	No
				Main Power SW	No
		Indicator		Power	Yes(Red)
				REC/OTR	Yes(Red)
				T-REC	Yes(Red)
				TV/VCR	No
		Terminals	Front	DVD	No
				Video Input	RCA x 1 (Yellow)
				Audio Input	RCA x 2 (L/MONO,R White,Red)
				USB	Yes
			Rear	Other Terminal	HeadPhone (Stereo & Mono, 3.5mm)
				Video Input	RCA x 1 (Yellow)
				Audio Input	RCA x 2 (L/MONO,R White,Red)
				Video Output	RCA x1 (Yellow)
				Audio Output	RCA x 2(Stereo White,Red)
				Digital Audio Output	Coaxial (DVD Only)
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-16	Set Size	Approx. W x D x H (mm)		573 x 481 x 517	
G-17	Weight	Net (Approx.)		27.0kg (59.5lbs)	
		Gross (Approx.)		30.5kg (67.3lbs)	

GENERAL SPECIFICATIONS

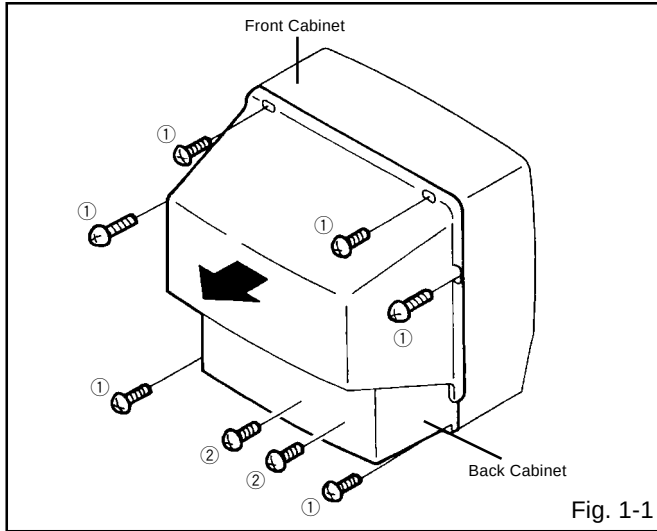
G-18	Carton	Master Carton	Content	No	
			Material	-	
			Dimensions W x D x H(mm)	-	
			Description of Origin	-	
		Gift Box	Material	Double/Brown	
			Dimensions W x D x H(mm)	658 x 575 x 625	
			Description of Origin	Yes	
		Drop Test	Natural Dropping At	1 Corner / 2 Edges / 4 Surfaces	
			Height (cm)	60(ORION SPEC:31)	
		Container Stuffing(40' container)		216	Sets
G-19	Material	Cabinet	Front	PS	94V0 DECABROM
			Rear	PS	94V0 DECABROM
			Jack Panel	-	
		PCB	Non-Halogen Demand	No	
			Eyelet Demand	Yes	
G-20	Environment	Environmental standard requirement (by buyer)		Green procurement of TOSHIBA	
		Pb-free		Phase3(Phase3A)	
		Measures for Whisker		Yes	

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

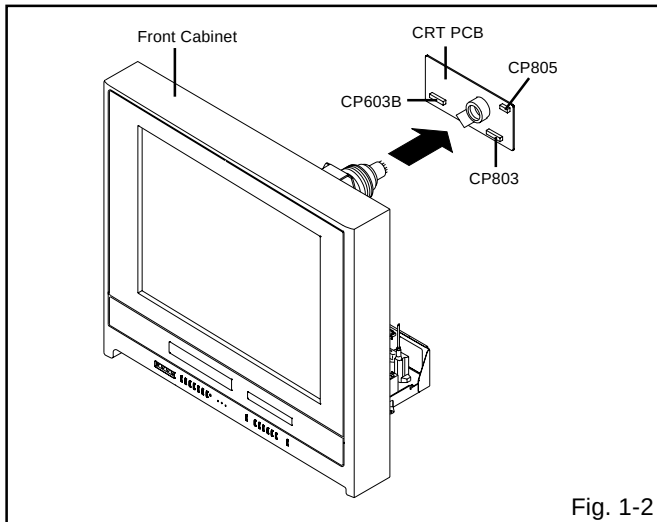
1. Remove the 6 screws ①.
2. Remove the 2 screws ②.
3. Remove the Back Cabinet in the direction of arrow.



1-2: CRT PCB (Refer to Fig. 1-2)

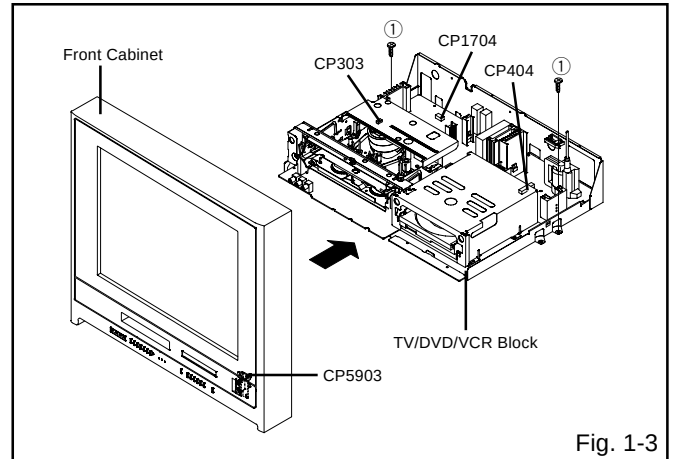
CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
(Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
(CP603B, CP803 and CP805).
3. Remove the CRT PCB in the direction of arrow.



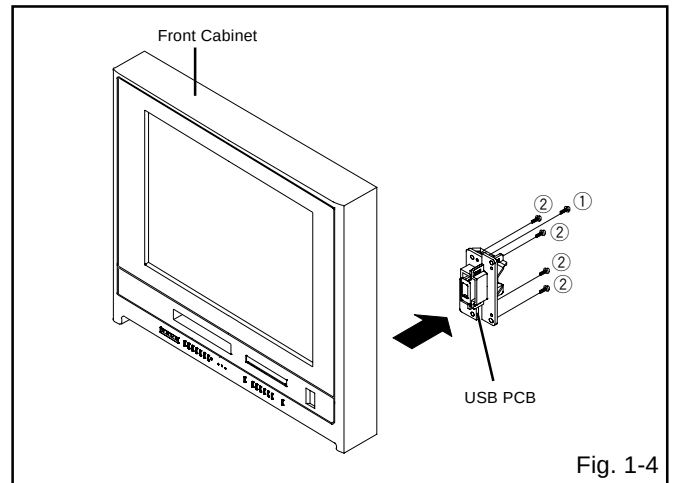
1-3: TV/DVD/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
(CP303, CP404, CP1704 and CP5903).
3. Remove the TV/DVD/VCR Block in the direction of arrow.



1-4: USB PCB (Refer to Fig. 1-4)

1. Remove the screw ①.
2. Remove the 4 screws ②.
3. Remove the USB PCB in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

1-5: VCR DECK (Refer to Fig. 1-5)

NOTE

Do not remove the cable at the FE Head section. The FE Head may be damaged if you remove the cable by force.

1. Remove the 2 screws ①.
2. Remove the VCR Top.
3. Move the Cassette Holder Ass'y to the back side.
4. Remove the 3 screws ②.
5. Remove the 2 screws ③.
6. Remove the Deck Shield Cover.
7. Remove the screw ④.
8. Remove the FE Head.
9. Disconnect the following connectors:
(CP101, CP4501 and CP4502).
10. Remove the VCR Deck in the direction of arrow.

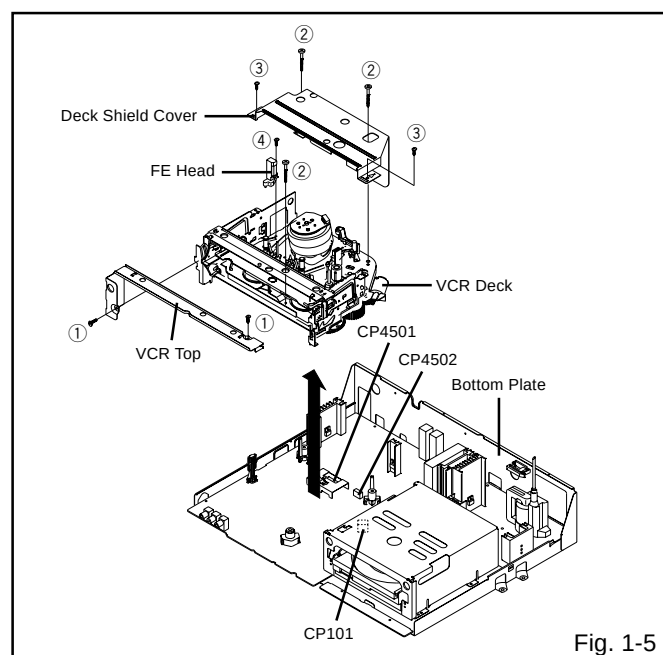


Fig. 1-5

1-6: VCR PCB (Refer to Fig. 1-6)

1. Remove the 6 screws ①.
2. Remove the screw ②.
3. Remove the AV Jack Shield.
4. Disconnect the following connectors:
(CP001, CP602B, CP604, CP2201, CP8001 and CP8002).
5. Remove the VCR PCB in the direction of arrow.

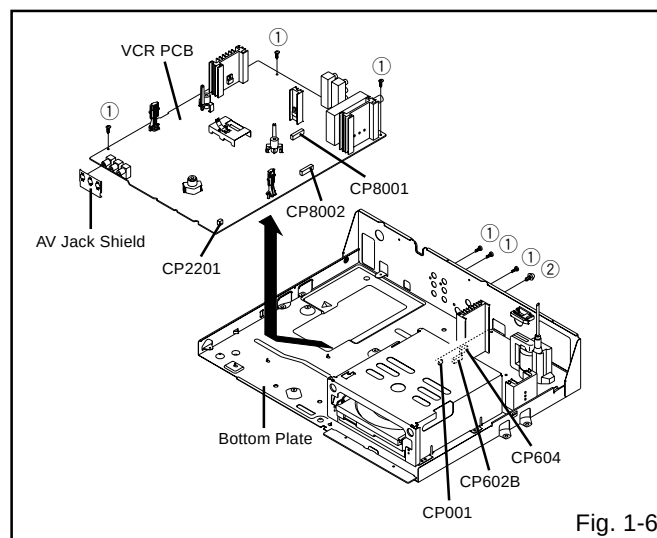


Fig. 1-6

1-7: DVD BLOCK/OPERATION PCB (Refer to Fig. 1-7)

1. Remove the 4 screws ①.
2. Remove the DVD Block in the direction of arrow (A).
3. Remove the 2 screws ②.
4. Remove the Operation PCB in the direction of arrow (B).

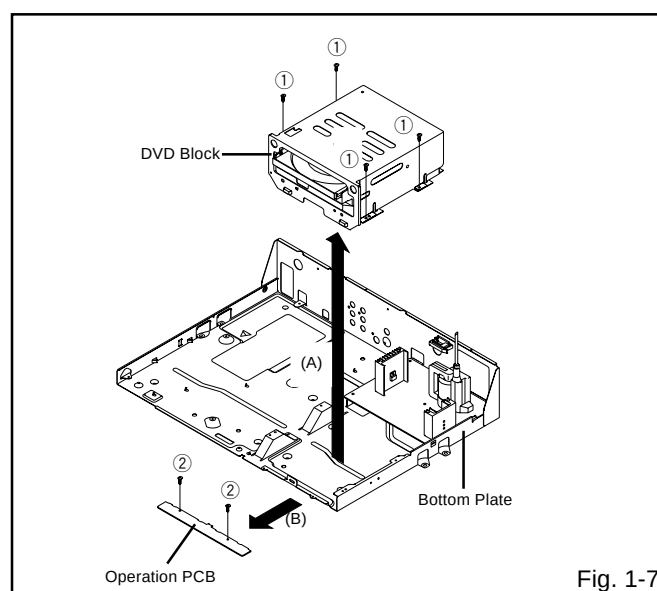


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

1-8: DVD PCB/DVD DECK (Refer to Fig. 1-8)

1. Short circuit the position shown in **Fig. 1-8** using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.
2. Remove the 4 screws ①.
3. Remove the DVD Top in the direction of arrow (A).
4. Remove the 4 screws ②.
5. Remove the DVD Deck in the direction of arrow (B).
6. Disconnect the following connectors:
(CP2301, CP2302 and CP2303).
7. Remove the 2 screws ③.
8. Remove the DVD PCB in the direction of arrow (C).

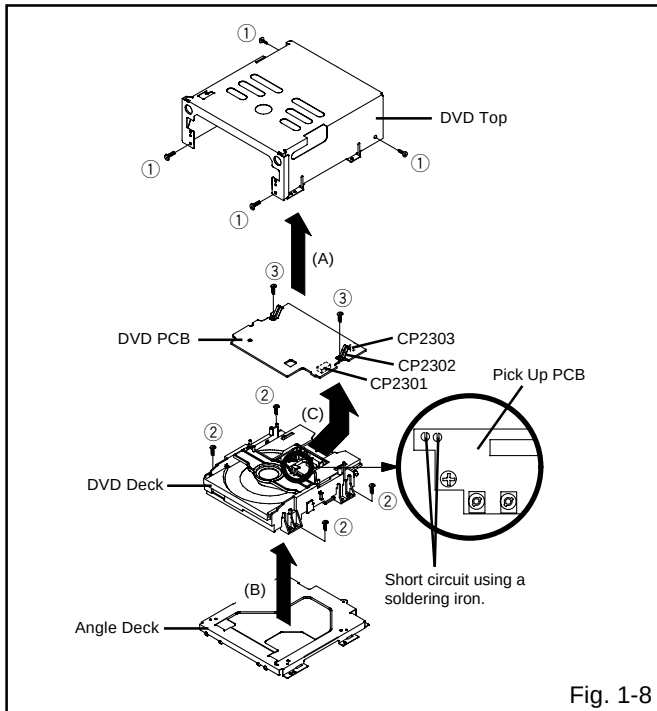


Fig. 1-8

1-9: DEFLECTION PCB (Refer to Fig. 1-9)

1. Remove the 2 screws ①.
2. Remove the 3 screws ②.
3. Remove the Deflection PCB in the direction of arrow.

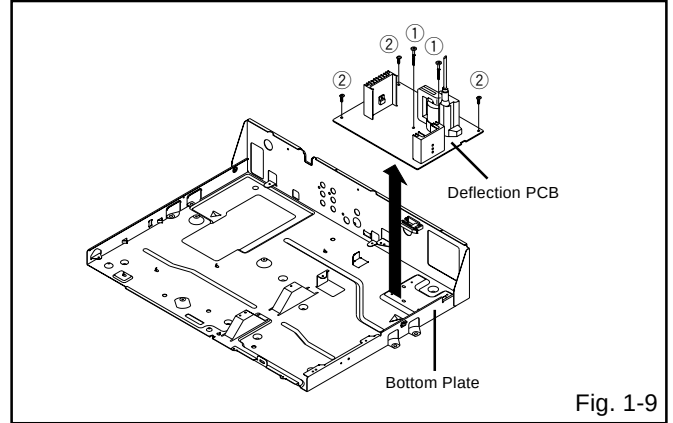


Fig. 1-9

NOTE

1. Before your operation, please read "PREPARATION OF SERVICING".
2. Use the Lead Free solder.
3. Manual soldering conditions
 - Soldering temperature: $350 \pm 5^{\circ}\text{C}$
 - Soldering time: Within 2 seconds
 - Soldering combination: Sn-3.0Ag-0.5Cu
4. When Soldering/Removing of solder, use the drawing equipment over the Pick Up Unit to keep the Flux smoke away from it.
5. When installing the DVD Deck, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

DISASSEMBLY INSTRUCTIONS

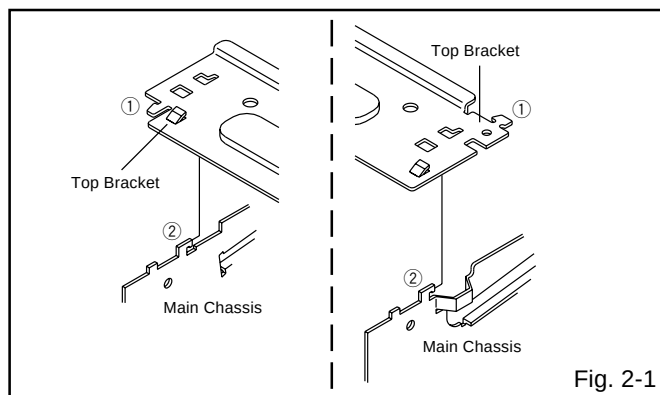
2. REMOVAL OF VCR DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

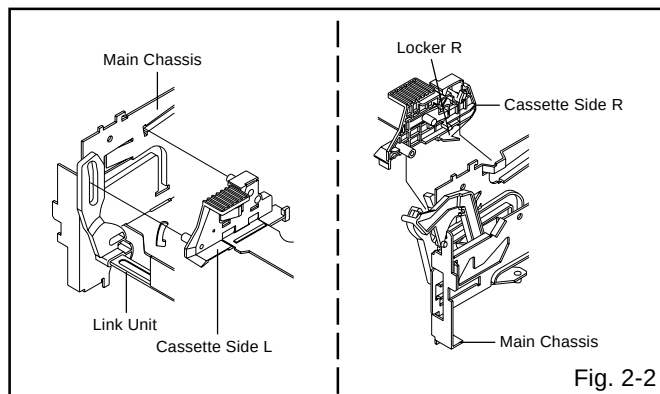
NOTE

1. After installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.



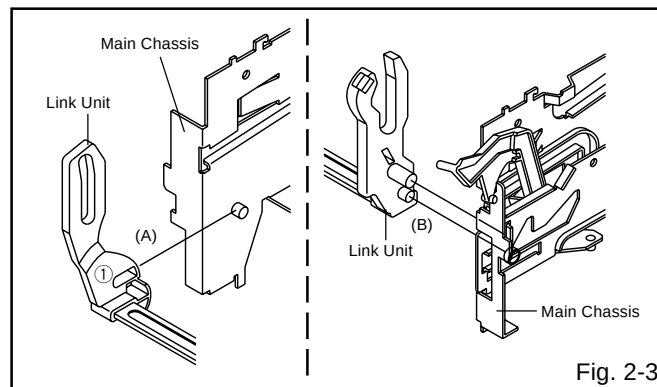
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.



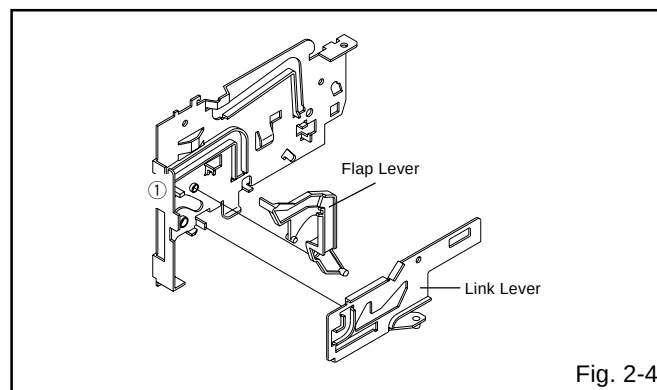
2-3: LINK UNIT (Refer to Fig. 2-3)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.



2-4: LINK LEVER/FLAP LEVER (Refer to Fig. 2-4)

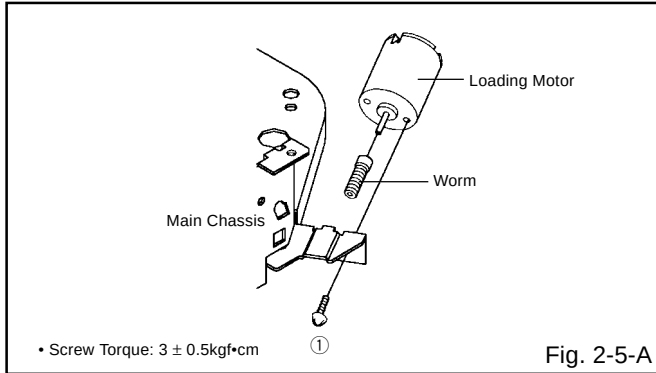
1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

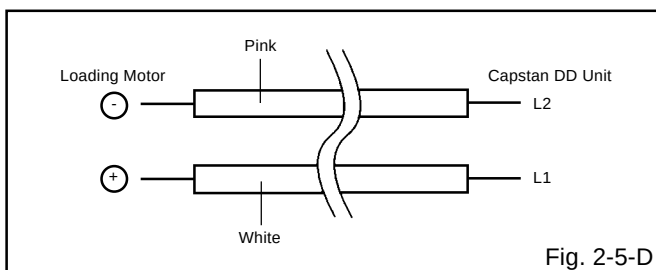
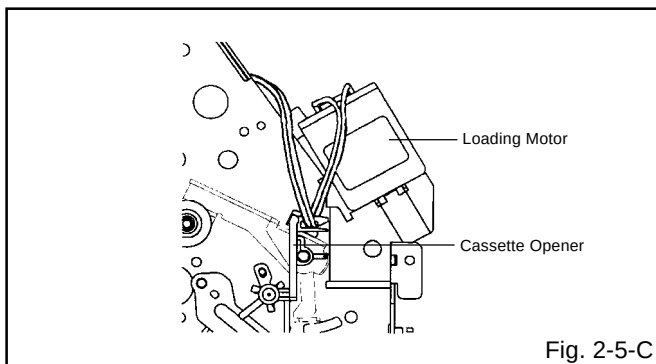
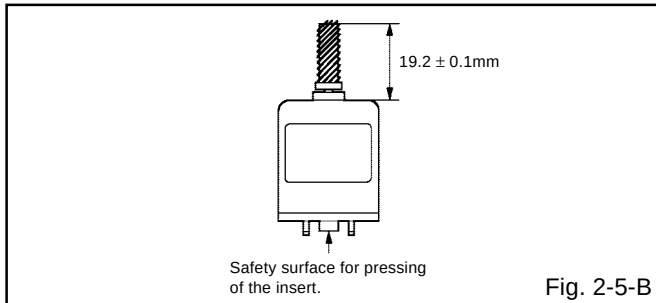
2-5: LOADING MOTOR/WORM (Refer to Fig. 2-5-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.



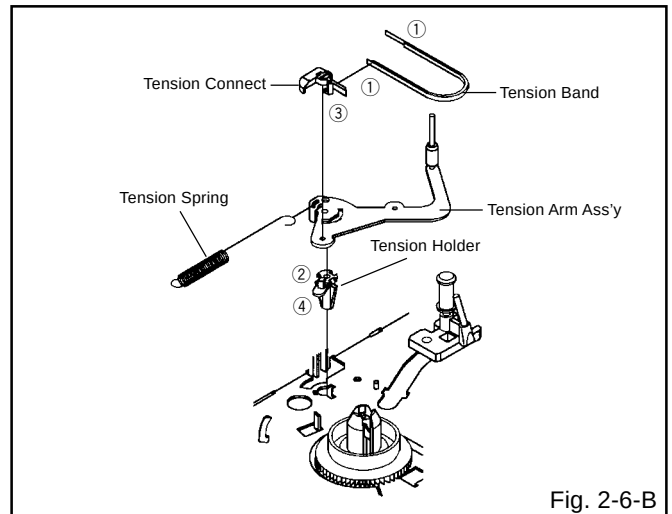
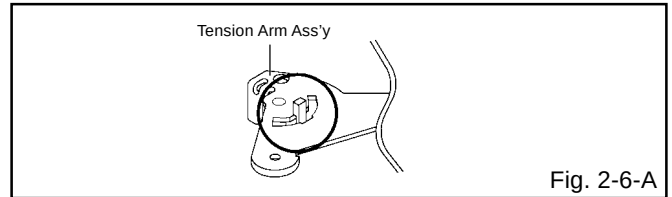
NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-5-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-5-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-5-D.



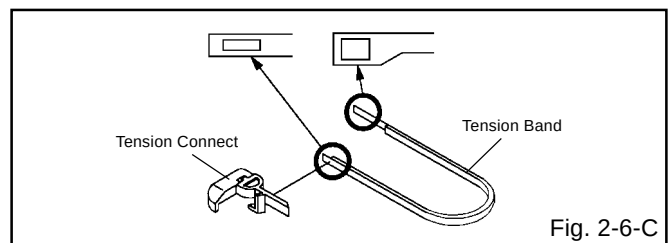
2-6: TENSION ASS'Y (Refer to Fig. 2-6-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-6-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

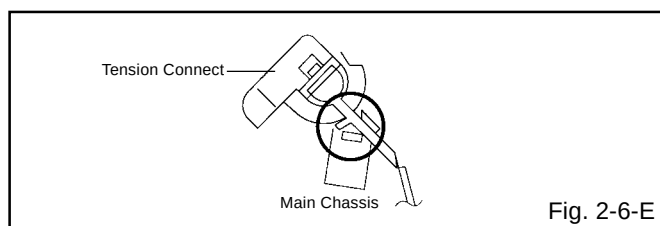
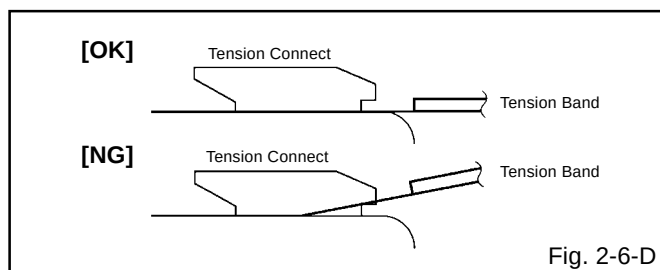


NOTE

1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-6-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-6-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-6-E.

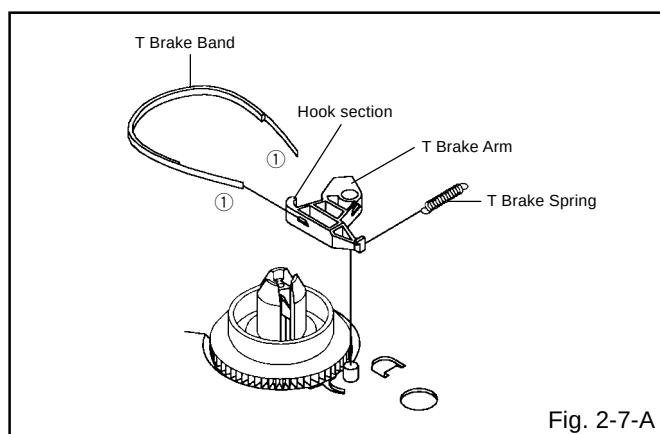


DISASSEMBLY INSTRUCTIONS



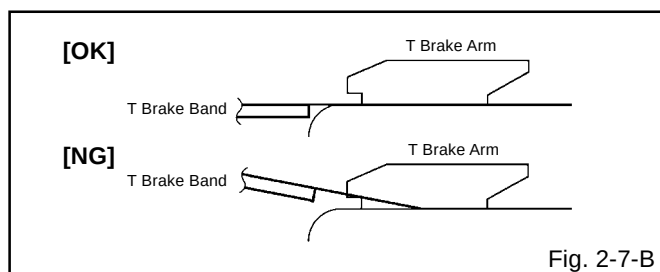
2-7: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-7-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.



NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-7-B.

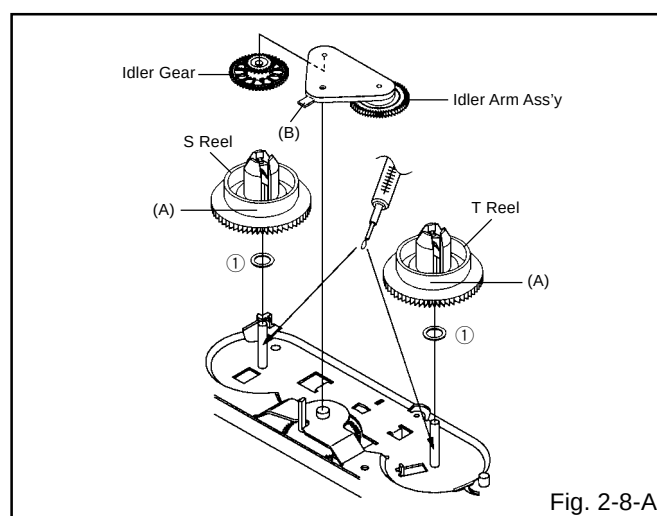


2-8: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-8-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

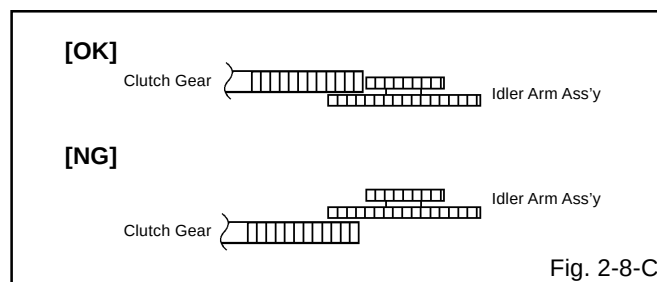
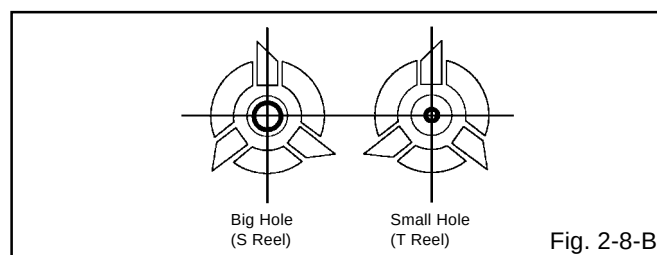
NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-8-A) Touching may leave stains on section "A".
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)



NOTE

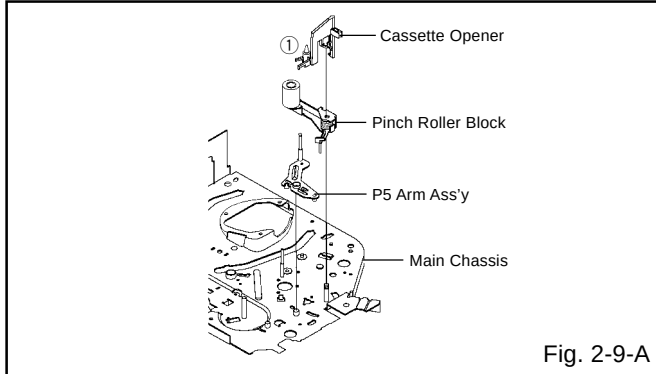
1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-8-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-8-C. And also set it so that the section "B" of Fig. 2-8-A is placed under the Main Chassis tab.



DISASSEMBLY INSTRUCTIONS

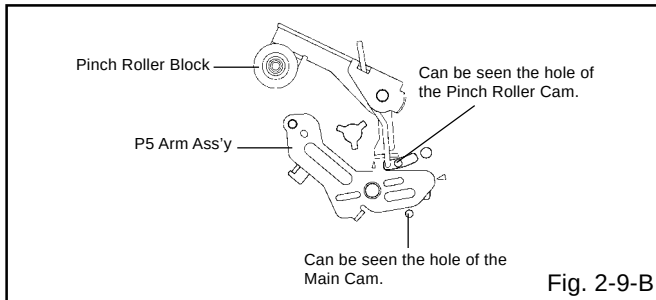
2-9: CASSETTE OPENER/PINCH ROLLER BLOCK/P5 ARM ASS'Y (Refer to Fig. 2-9-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.



NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-9-B.

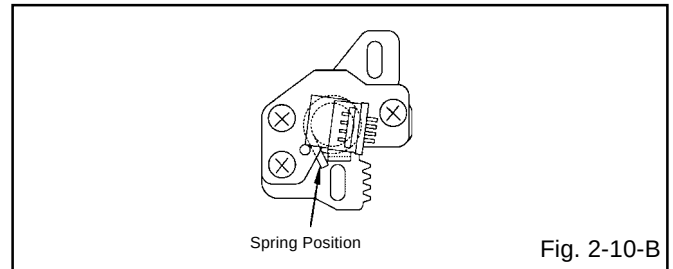
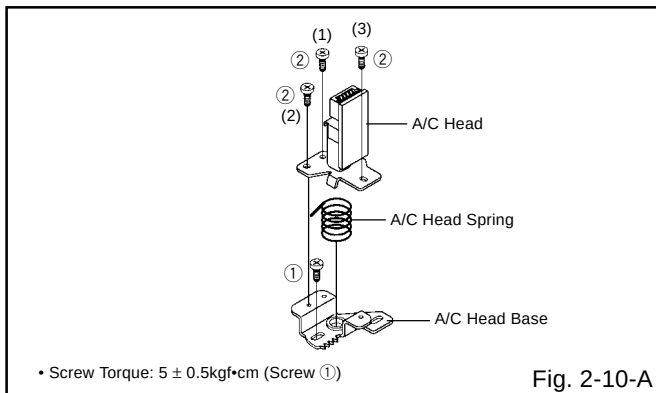


2-10: A/C HEAD (Refer to Fig. 2-10-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

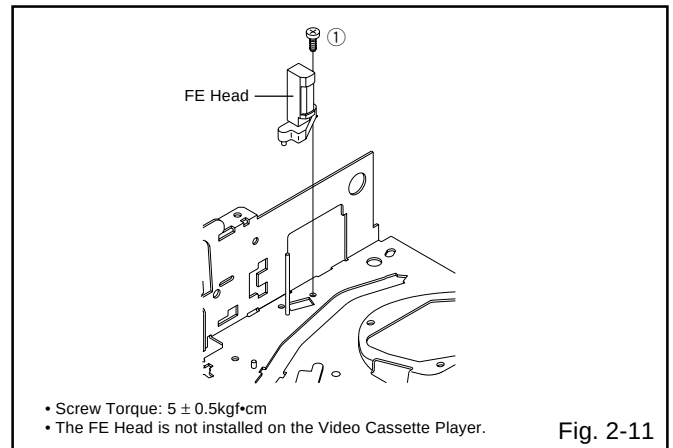
NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-10-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



2-11: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-11)

1. Remove the screw ①.
2. Remove the FE Head.

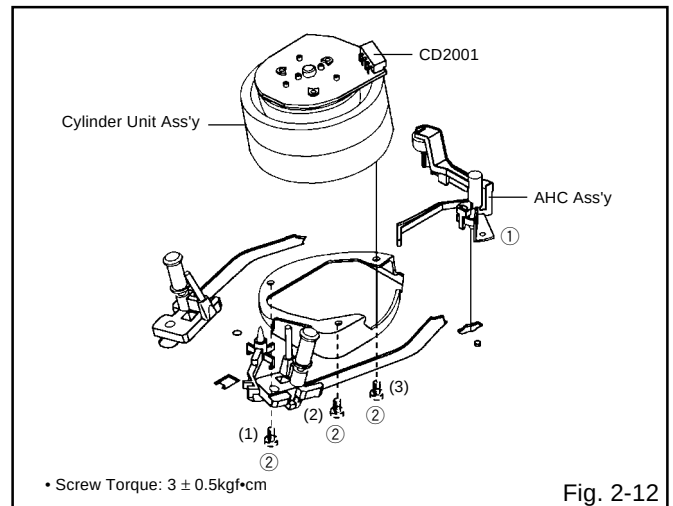


2-12: CYLINDER UNIT ASS'Y (Refer to Fig. 2-12)

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001).
3. Remove the 3 screws ②.
4. Remove the Cylinder Unit Ass'y.

NOTE

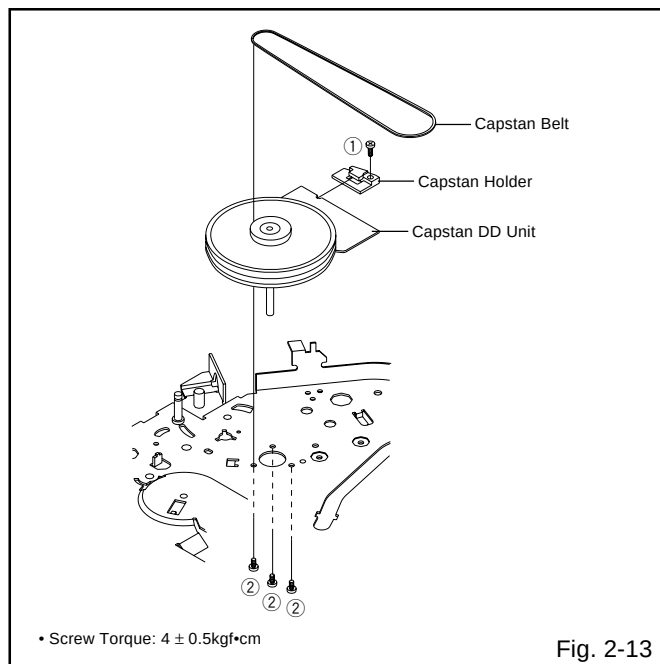
1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



DISASSEMBLY INSTRUCTIONS

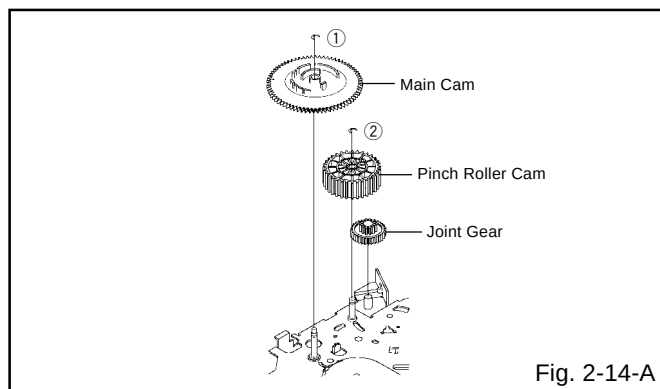
2-13: CAPSTAN DD UNIT (Refer to Fig. 2-13)

1. Remove the Capstan Belt.
2. Remove the screw ①.
3. Remove the Capstan Holder.
4. Remove the 3 screws ②.
5. Remove the Capstan DD Unit.



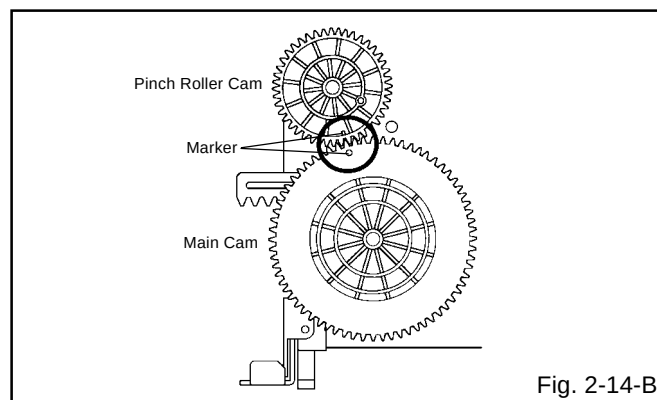
2-14: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-14-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.



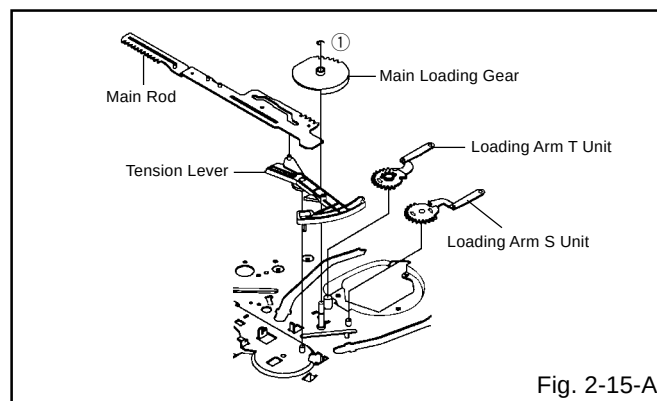
NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as shown in the circled section of Fig. 2-14-B so that the markers meet. (Refer to Fig. 2-14-B) And also can be seen the Main Chassis hole through the Main Cam maker hole.



2-15: LOADING GEAR S/T UNIT (Refer to Fig. 2-15-A)

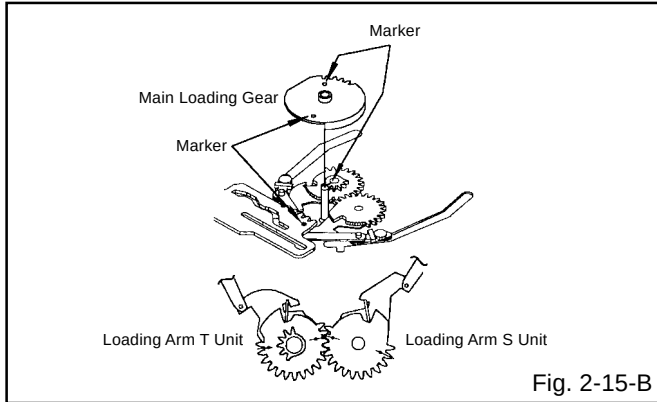
1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.



DISASSEMBLY INSTRUCTIONS

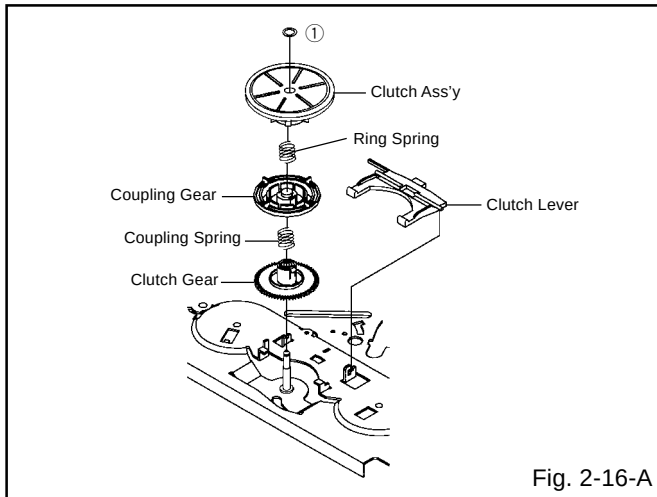
NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. (Refer to Fig. 2-15-B)



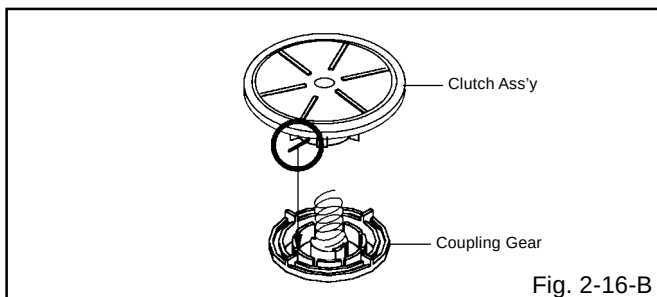
2-16: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-16-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.



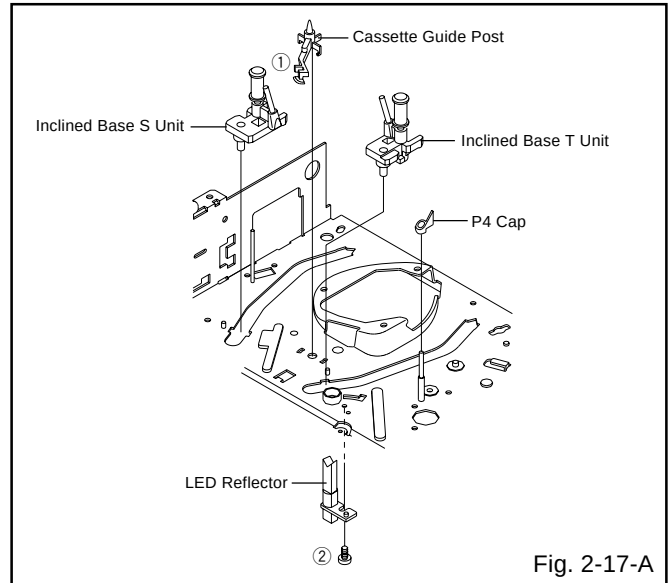
NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-16-B)



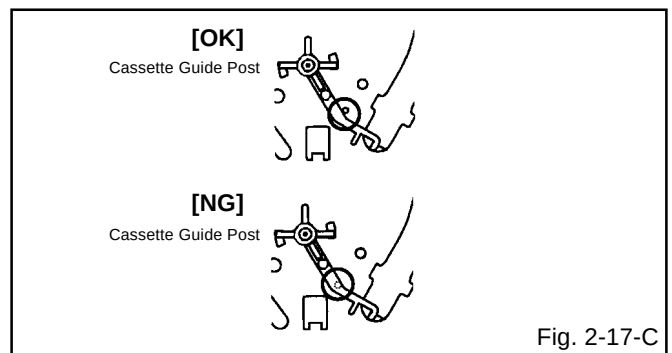
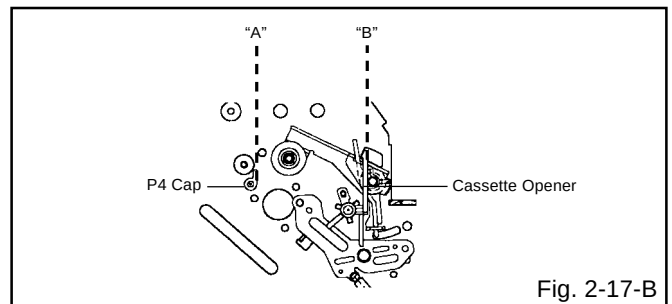
2-17: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP/LED REFLECTOR (Refer to Fig. 2-17-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw ②.
5. Remove the LED Reflector.



NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-17-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-17-C.



DISASSEMBLY INSTRUCTIONS

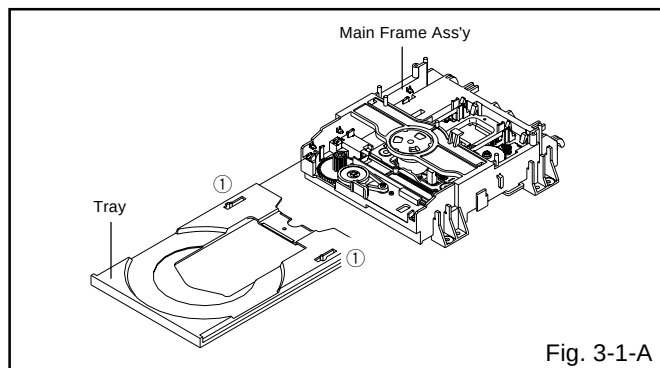
3. REMOVAL OF DVD DECK PARTS

NOTE

1. Do not disassemble the DVD DECK PARTS except listed parts here. Minute adjustments are needed if the disassemble is done. If the repair is needed except listed parts, replace the DVD MECHA ASS'Y.

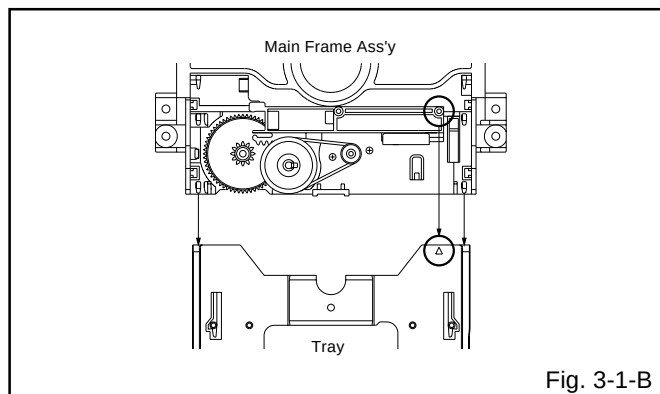
3-1: TRAY (Refer to Fig. 3-1-A)

1. Set the Tray opened. (Refer to the DISC REMOVAL METHOD AT NO POWER SUPPLY)
2. Unlock the 2 supports ① and remove the Tray.



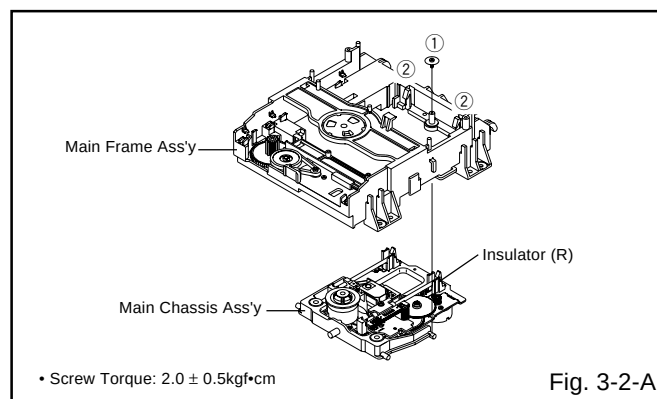
NOTE

1. In case of the Tray installation, install them as the circled section of Fig. 3-1-B so that the each markers are met.



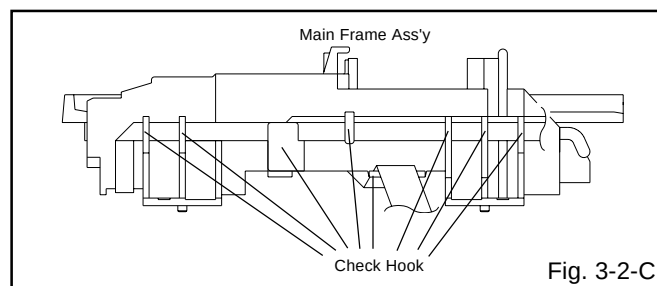
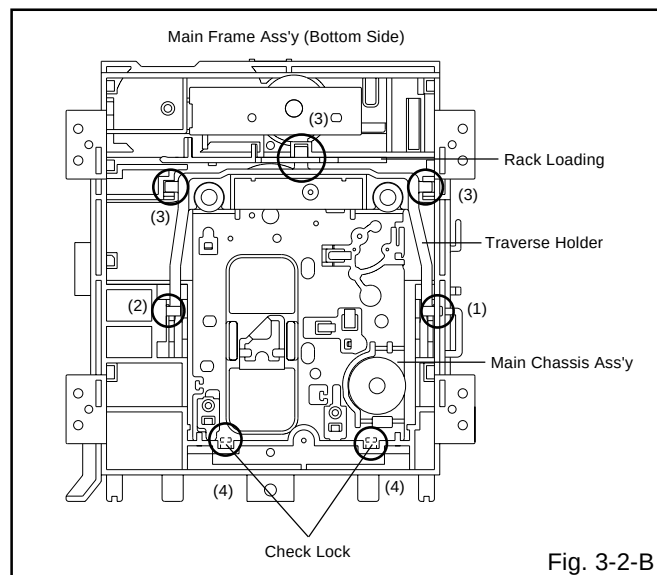
3-2: MAIN CHASSIS ASS'Y (Refer to Fig. 3-2-A)

1. Remove the screw ①.
2. Unlock the 2 supports ②.
3. Remove the Insulator (R) from the Main Frame Ass'y.
4. Remove the Main Chassis Ass'y.



NOTE

1. In case of the Main Chassis Ass'y, install it from (1) to (4) in order. (Refer to Fig. 3-2-B)
2. In case of the Main Chassis Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-2-C.



DISASSEMBLY INSTRUCTIONS

3-3: LOADING MOTOR PCB ASS'Y/ LOADING BELT (Refer to Fig. 3-3-A)

1. Remove the Loading Belt.
2. Remove the screw ①.
3. Remove the 2 screws ②.
4. Remove the Loading Motor PCB Ass'y.
5. Remove the Pulley Gear.

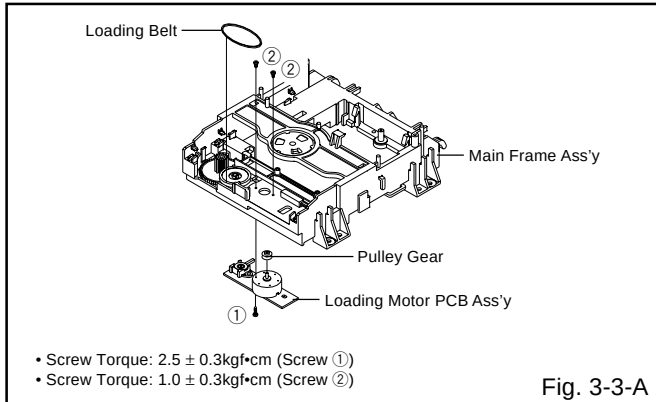


Fig. 3-3-A

NOTE

1. In case of the Pulley Motor installation, check if the value of the Fig. 3-3-B is correct.
2. When installing the Loading Motor PCB Ass'y, install it correctly as Fig. 3-3-C.
3. In case of the Loading Motor PCB Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-3-C.

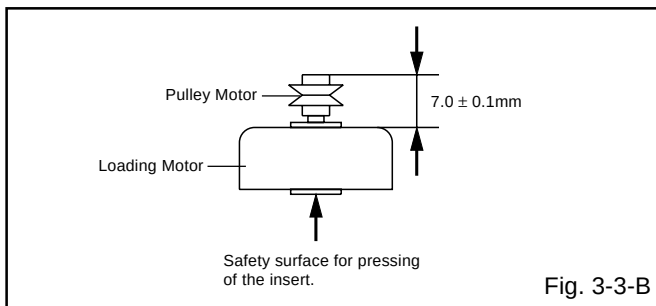


Fig. 3-3-B

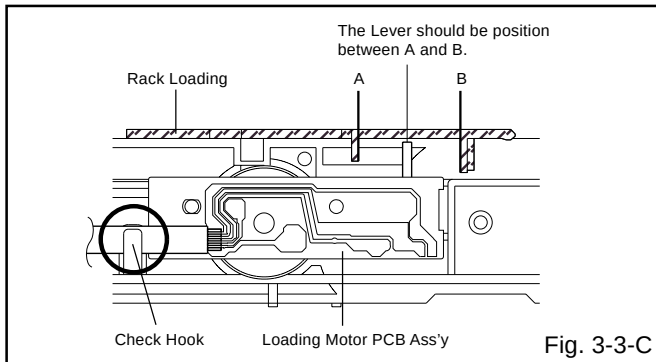


Fig. 3-3-C

3-4: RACK LOADING/MAIN GEAR/PULLEY GEAR (Refer to Fig. 3-4-A)

1. Press down the catcher ① and slide the Rack Loading.
2. Unlock the support ② and remove the Pulley Gear.
3. Remove the Main Gear.

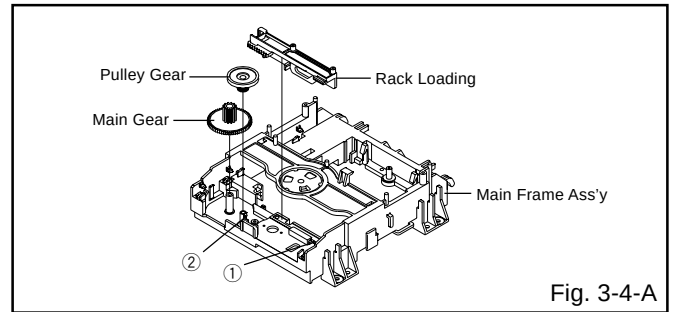


Fig. 3-4-A

NOTE

1. In case of the Rack Loading installation, do not mesh it to the Main Gear as shown the Fig. 3-4-B.

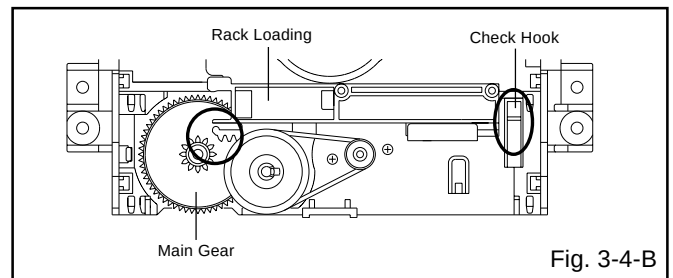


Fig. 3-4-B

3-5: CLAMPER ASS'Y (Refer to Fig. 3-5-A)

1. Press the Clamper and rotate the Clamper Plate clockwise, then unlock the 3 supports ①.
2. Remove the Clamper Plate, Clamper Magnet and Clamper.

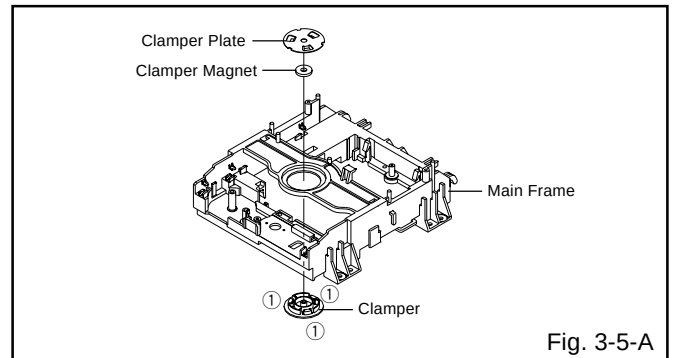


Fig. 3-5-A

NOTE

1. In case of the Clamper Ass'y installation, install correctly as Fig. 3-5-B.

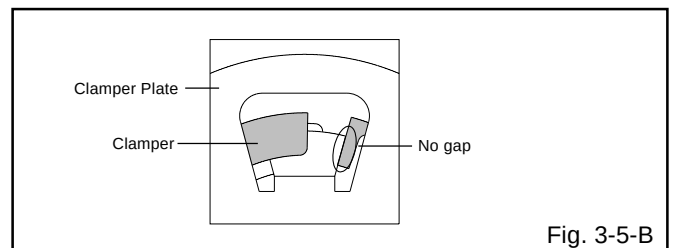
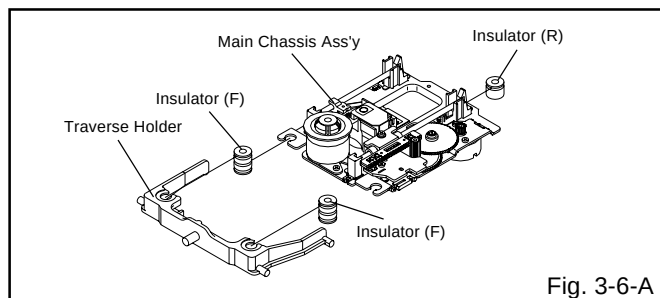


Fig. 3-5-B

DISASSEMBLY INSTRUCTIONS

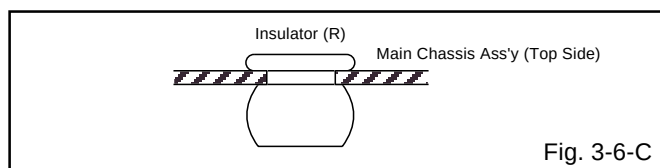
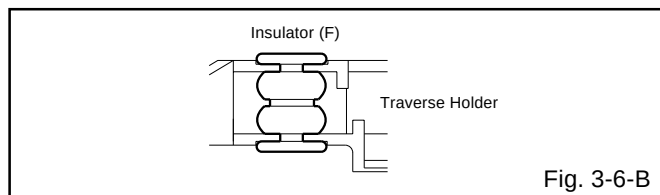
3-6: TRAVERSE HOLDER/INSULATOR (F)/INSULATOR (R) (Refer to Fig. 3-6-A)

1. Remove the Traverse Holder.
2. Remove the 2 Insulator (F).
3. Remove the Insulator (R).



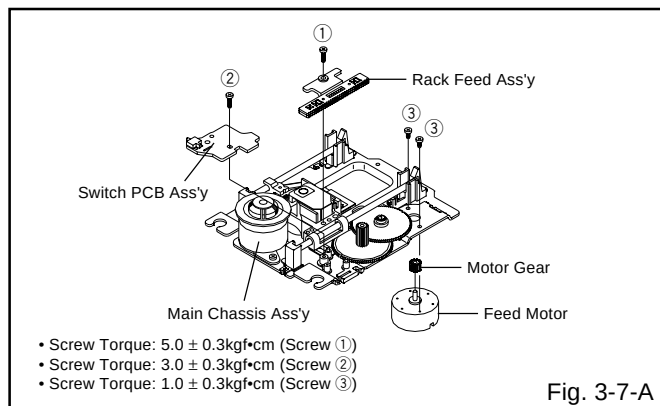
NOTE

1. In case of the Insulator (F) installation, install correctly as Fig. 3-6-B.
2. In case of the Insulator (R) installation, install correctly as Fig. 3-6-C.



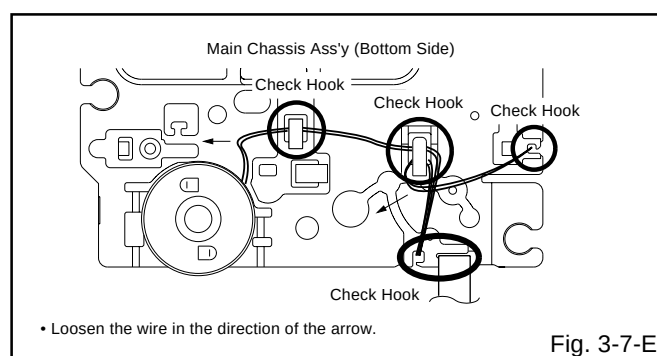
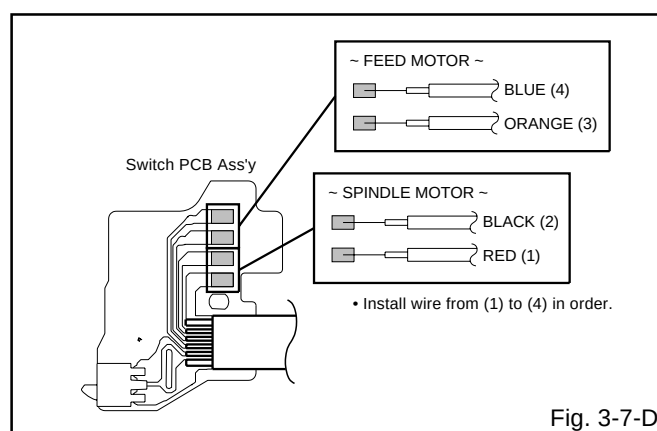
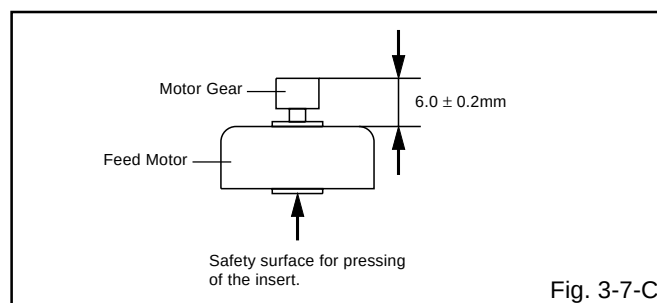
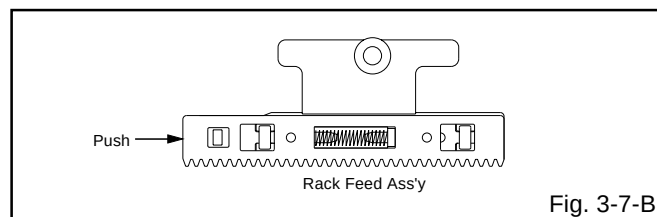
3-7: RACK FEED ASS'Y/SWITCH PCB ASS'Y/FEED MOTOR (Refer to Fig. 3-7-A)

1. Remove the screw ①.
2. Remove the Rack Feed Ass'y.
3. Remove the screw ②.
4. Remove the Switch PCB Ass'y.
5. Remove the 2 screw ③.
6. Remove the Feed Motor.
7. Remove the Motor Gear.



NOTE

1. When pushing the Rack Feed in the direction of the arrow, it should be restored to the original position by the spring force. (Refer to Fig. 3-7-B)
2. In case of the Motor Gear installation, check if the value of the Fig. 3-7-C is correct.
3. When installing the wire of the Switch PCB Ass'y, install it correctly as Fig. 3-7-D.
4. After the assembly of the Main Chassis Ass'y, hook the wire on the Main Chassis Ass'y as shown Fig. 3-7-E.



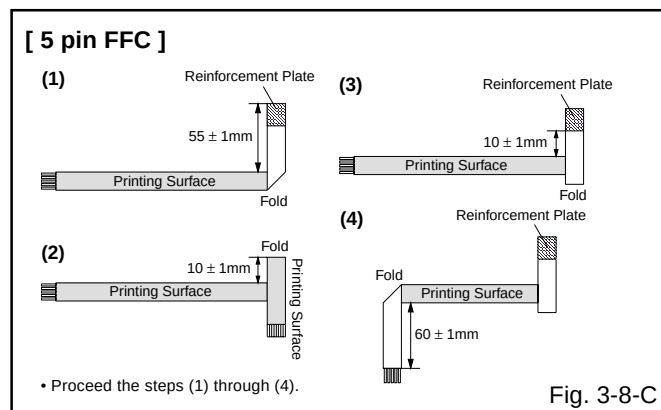
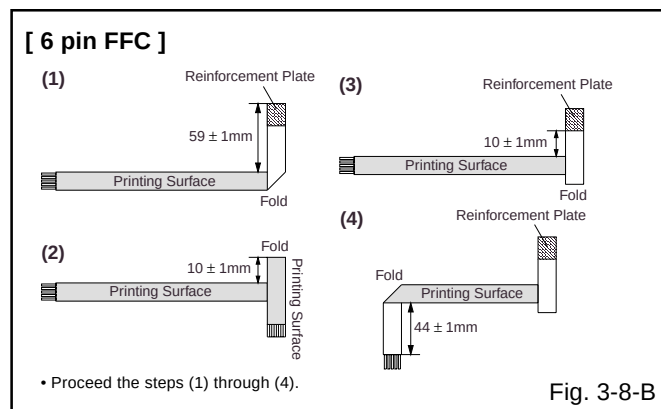
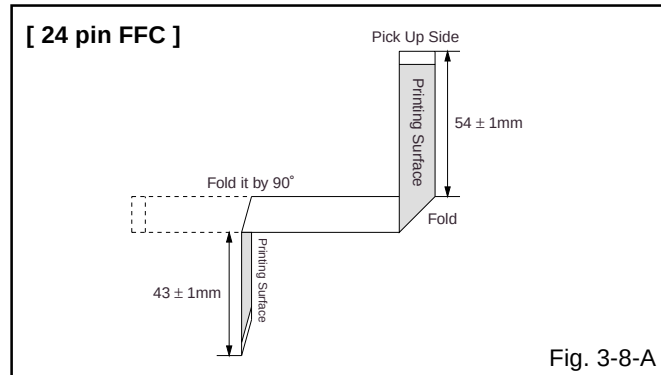
DISASSEMBLY INSTRUCTIONS

3-8: FFC WIRE HANDLING

1. When installing the FFC, fold it correctly and install it as shown from Fig. 3-8-A to Fig. 3-8-C.

NOTE

1. Do not make the folding lines except the specified positions for the FFC.



DISASSEMBLY INSTRUCTIONS

4. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

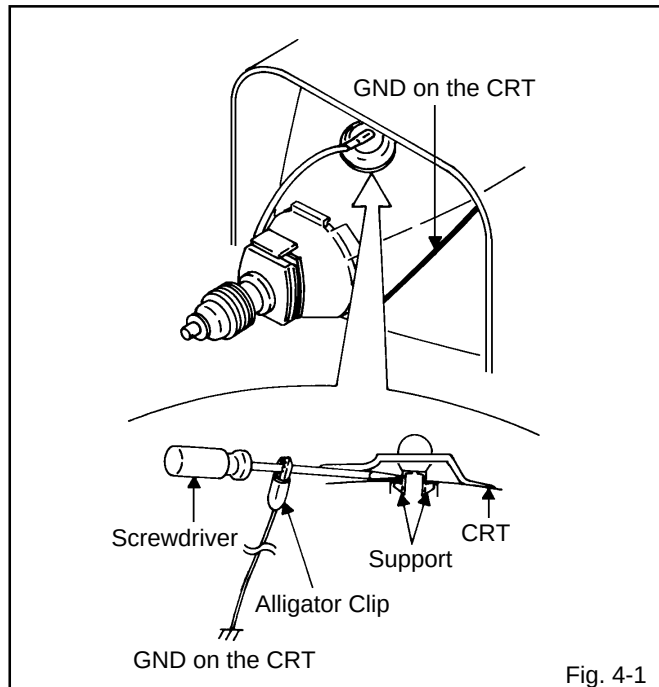
- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

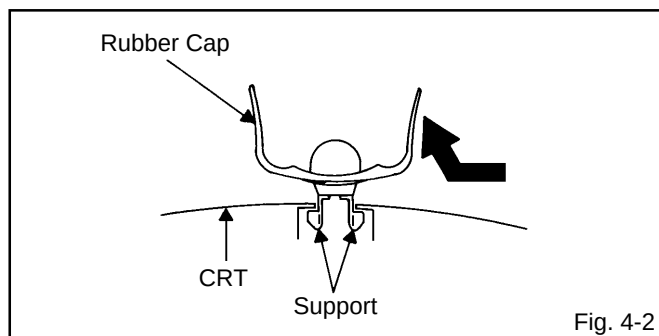
1. Follow the steps as follows to discharge the Anode Cap.
(Refer to Fig. 4-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.



2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support.
(Refer to Fig. 4-2.)



3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

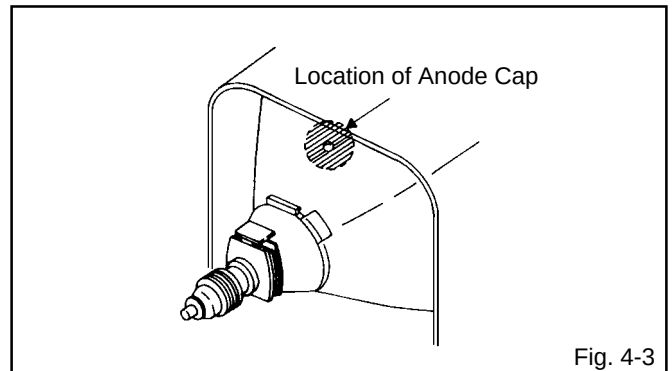
Take care not to damage the Rubber Cap.

INSTALLATION

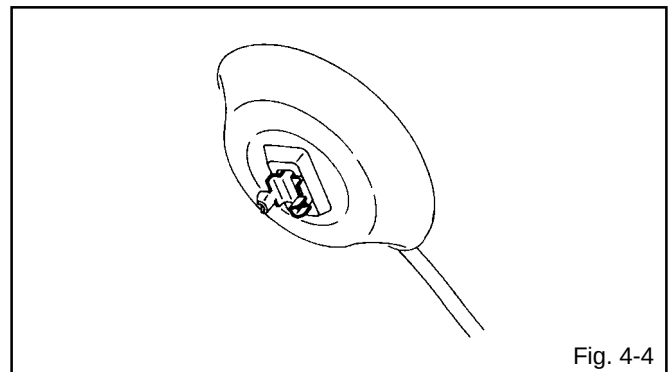
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 4-3.)

NOTE

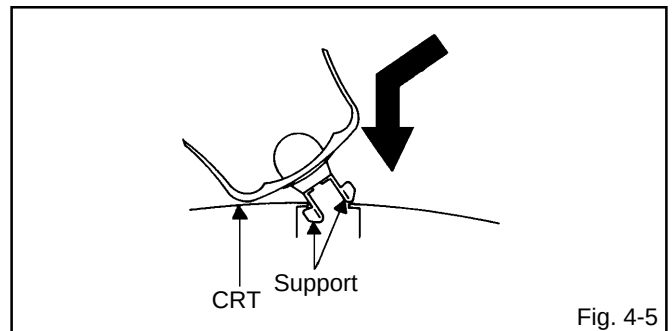
Confirm that there is no dirt, dust, etc. at the spot where the cap was located.



2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 4-4.)



4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 4-5.



5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

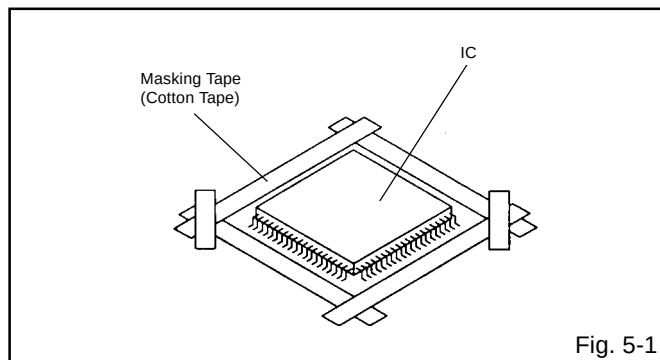
5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 5-1.)

NOTE

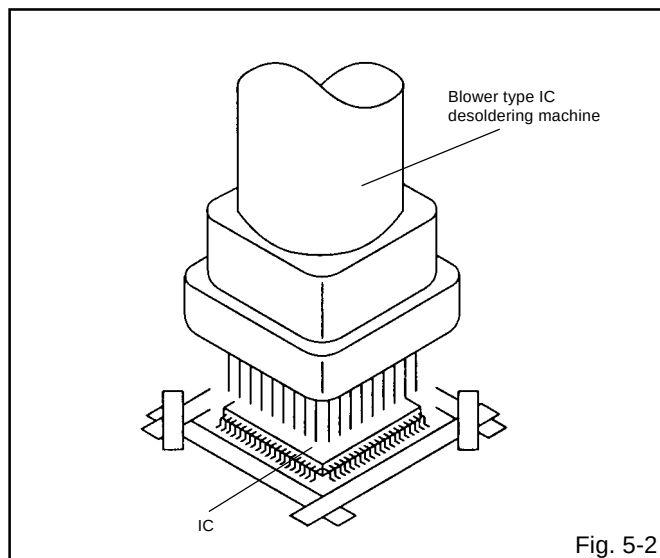
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 5-2.)

NOTE

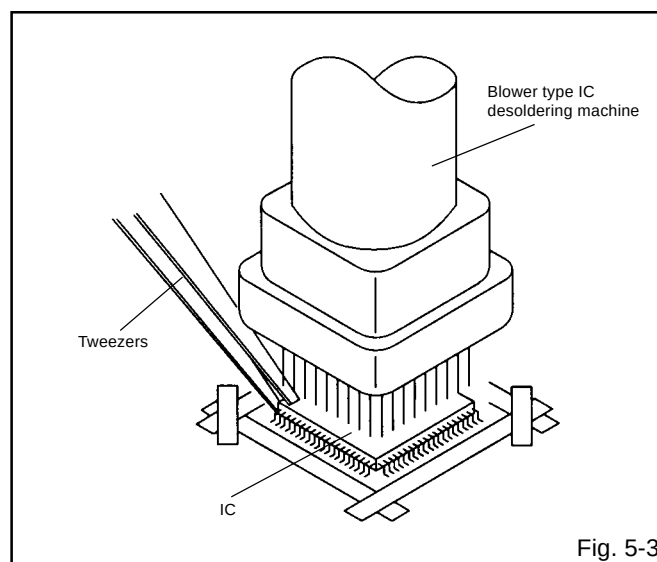
Do not rotate or move the IC back and forth, until IC can move back and forth easily after desoldering the leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 5-3.)

NOTE

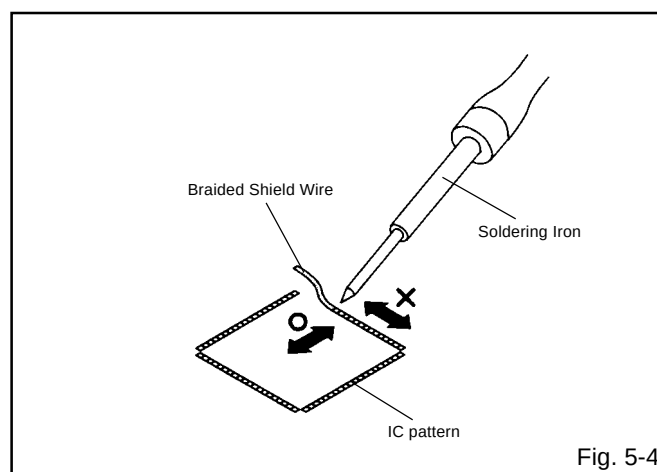
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 5-4.)

NOTE

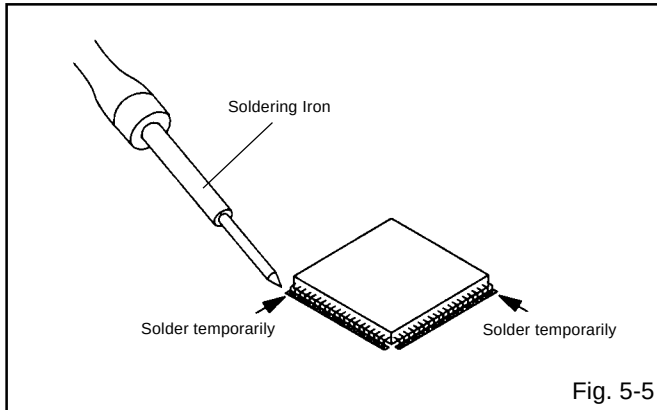
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



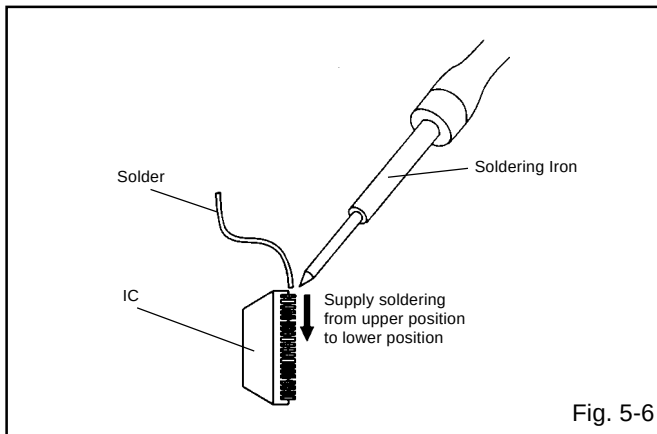
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 5-5.)



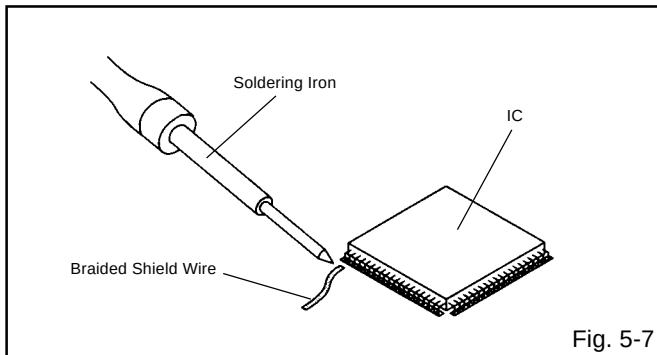
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 5-6.)



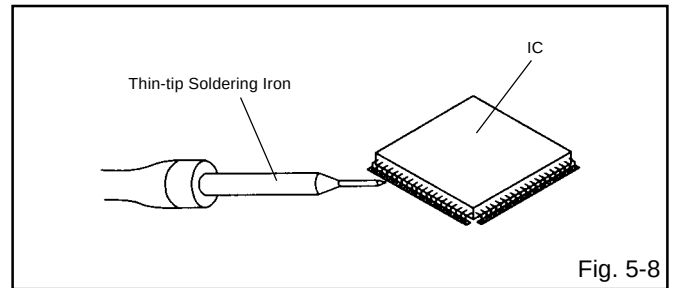
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 5-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 5-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	: Audio/Control	H.SW	: Head Switch
	ACC	: Automatic Color Control	Hz	: Hertz
	AE	: Audio Erase	I IC	: Integrated Circuit
	AFC	: Automatic Frequency Control	IF	: Intermediate Frequency
	AFT	: Automatic Fine Tuning	IND	: Indicator
	AFT DET	: Automatic Fine Tuning Detect	INV	: Inverter
	AGC	: Automatic Gain Control	K KIL	: Killer
	AMP	: Amplifier	L L	: Left
	ANT	: Antenna	LED	: Light Emitting Diode
	A.PB	: Audio Playback	LIMIT AMP	: Limiter Amplifier
	APC	: Automatic Phase Control	LM, LDM	: Loading Motor
	ASS'Y	: Assembly	LP	: Long Play
	AT	: All Time	L.P.F	: Low Pass Filter
	AUTO	: Automatic	LUMI.	: Luminance
	A/V	: Audio/Video	M M	: Motor
B	BGP	: Burst Gate Pulse	MAX	: Maximum
	BOT	: Beginning of Tape	MINI	: Minimum
	BPF	: Bandpass Filter	MIX	: Mixer, mixing
	BRAKE SOL	: Brake Solenoid	MM	: Monostable Multivibrator
	BUFF	: Buffer	MOD	: Modulator, Modulation
	B/W	: Black and White	MPX	: Multiplexer, Multiplex
C	C	: Capacitance, Collector	MS SW	: Mecha State Switch
	CASE	: Cassette	N NC	: Non Connection
	CAP	: Capstan	NR	: Noise Reduction
	CARR	: Carrier	O OSC	: Oscillator
	CH	: Channel	OPE	: Operation
	CLK	: Clock	P PB	: Playback
	CLOCK (SY-SE)	: Clock (Syscon to Servo)	PB CTL	: Playback Control
	COMB	: Combination, Comb Filter	PB-C	: Playback-Chrominance
	CONV	: Converter	PB-Y	: Playback-Luminance
	CPM	: Capstan Motor	PCB	: Printed Circuit Board
	CTL	: Control	P. CON	: Power Control
	CYL	: Cylinder	PD	: Phase Detector
	CYL-M	: Cylinder-Motor	PG	: Pulse Generator
	CYL SENS	: Cylinder-Sensor	P-P	: Peak-to Peak
D	DATA (SY-CE)	: Data (Syscon to Servo)	R R	: Right
	dB	: Decibel	REC	: Recording
	DC	: Direct Current	REC-C	: Recording-Chrominance
	DD Unit	: Direct Drive Motor Unit	REC-Y	: Recording-Luminance
	DEMOD	: Demodulator	REEL BRK	: Reel Brake
	DET	: Detector	REEL S	: Reel Sensor
	DEV	: Deviation	REF	: Reference
E	E	: Emitter	REG	: Regulated, Regulator
	EF	: Emitter Follower	REW	: Rewind
	EMPH	: Emphasis	REV, RVS	: Reverse
	ENC	: Encoder	RF	: Radio Frequency
	ENV	: Envelope	RMC	: Remote Control
	EOT	: End of Tape	RY	: Relay
	EQ	: Equalizer	S S. CLK	: Serial Clock
	EXT	: External	S. COM	: Sensor Common
F	F	: Fuse	S. DATA	: Serial Data
	FBC	: Feed Back Clamp	SEG	: Segment
	FE	: Full Erase	SEL	: Select, Selector
	FF	: Fast Forward, Flipflop	SENS	: Sensor
	FG	: Frequency Generator	SER	: Search Mode
	FL SW	: Front Loading Switch	SI	: Serial Input
	FM	: Frequency Modulation	SIF	: Sound Intermediate Frequency
	FSC	: Frequency Sub Carrier	SO	: Serial Output
	FWD	: Forward	SOL	: Solenoid
G	GEN	: Generator	SP	: Standard Play
	GND	: Ground	STB	: Serial Strobe
H	H.P.F	: High Pass Filter	SW	: Switch

KEY TO ABBREVIATIONS

S	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	TR	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	UNREG	:	Unregulated
V	V	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	XÍTAL	:	Crystal
Y	Y/C	:	Luminance/Chrominance

SERVICE MODE LIST

This unit is provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter to the SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Standard Time (seconds)	Operations
VOL. (-) MIN	0	2	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	2	Initialization of factory data. NOTE: Do not use this for normal servicing. If you set factory initialization, the memories are reset such as the channel setting, the POWER ON total hours, and PLAY/ REC total hours.
VOL. (-) MIN	3	2	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	2	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	2	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
VOL. (-) MIN	6	2	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	2	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).
REC/OTR	4	2	Initialization of factory DVD data. NOTE: Do not use this for normal servicing. While pressing the Remocon Key for more than the Standard Time, press the Set Key simultaneously.
STOP (DVD)	7	3	Releasing of PARENTAL LOCK. Refer to the "PARENTAL CONTROL - RATING LEVEL".
STOP (DVD)	9	3	Tray cannot be opened. Refer to the "TRAY LOCK"

Set Key	Set Key	Standard Time (seconds)	Operations
VOL. (-) MIN	FF	2	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

Method	Operations
Press the following remocon keys continuously. SETUP → SUBTITLE → 3 → AUDIO → 0	Tray cannot be opened. Refer to the "TRAY LOCK".

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

Parts replacing time does not mean the life span for individual parts.

Also, long term storage or misuse may cause transformation and aging of rubber parts.

The following list means standard hours, so the checking hours depends on the conditions.

Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Assy		●	●	●	●	
Idler Arm Assy		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean

● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

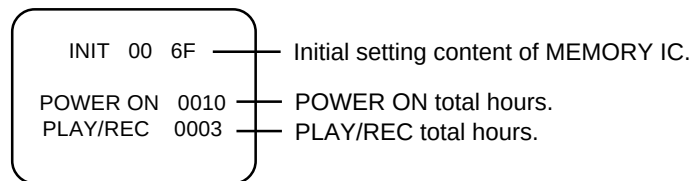
POWER ON total hours and PLAY/REC total hours can be checked on the screen.

Total hours are displayed in 16 system of notation.

NOTE: If you set factory initialization, the total hours is reset to "0".

Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On or alternatively, discharge backup capacitor.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

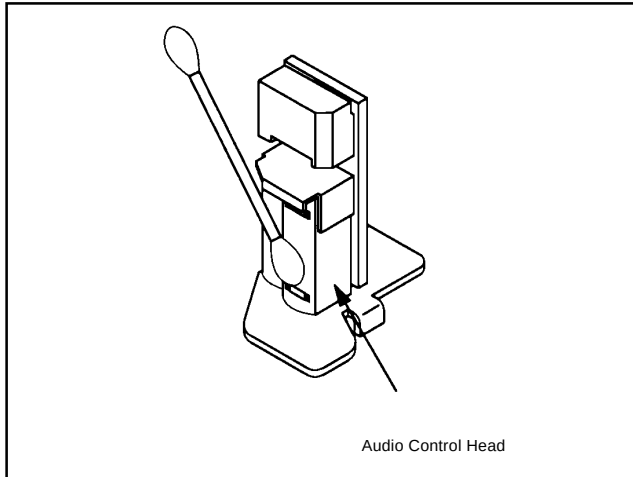
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with a cotton stick soaked by alcohol. Clean the full erase head in the same manner. (Refer to the figure below.)



2. TAPE RUNNING SYSTEM

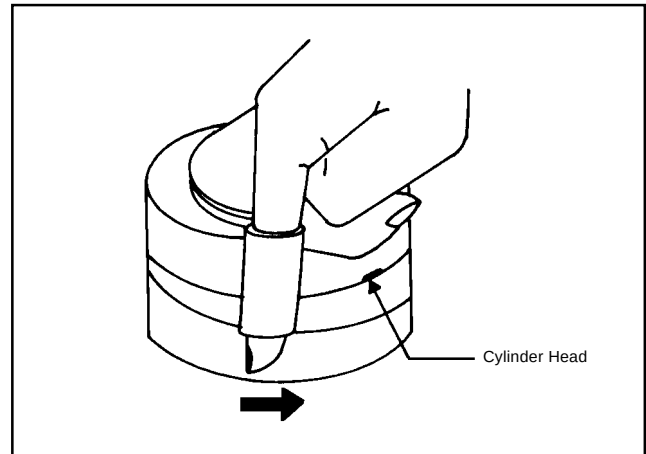
When cleaning the tape transport system, use gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). (Refer to the figure below.)

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	6F	40	34	00	C3	DF	47	22	86	44	D0	18	A6	01	86	65
10	40	0F	E3	52	03	02	00	48	00	F6	15	4B	1F	54	83	B1
20	99	96	8B	9F	B7	AA	91	B6	1A	0B	3D	08	37	16	27	30
30	45	31	33	FF	00	CD	0D	00	00	23	FF	FF	FF	80	88	83
40	88	89	88	FF	FF	---	---	---	---	---	---	---	---	---	---	---
50	05	08	0A	0B	0D	10	12	15	17	19	1B	1D	1D	1E	1E	1E
60	1F	1F	1F	20	20	20	21	21	22	22	22	23	23	23	24	24
70	24	25	25	25	26	26	26	27	27	28	28	29	29	2A	2A	2B
80	2B	2C	2D	2D	2E	30	32	35	36	37	38	38	39	3B	3C	3F

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

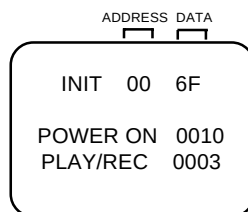


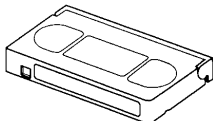
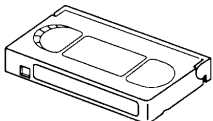
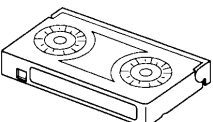
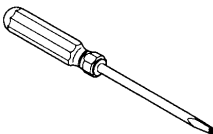
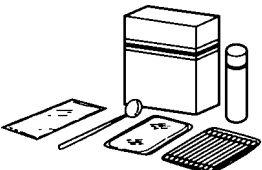
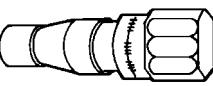
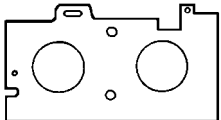
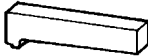
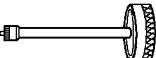
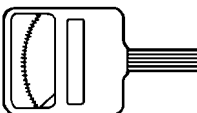
Fig. 1

3. ADDRESS is now selected and should "blink". Using the UP or DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using UP or DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

After the data input, set to the initializing of shipping.

9. Turn POWER on.
 10. Press both VOL. DOWN button on the set and the Channel button **(1)** on the remote control for more than 2 seconds.
 11. After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG185 Tentelometer 

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG185	APJG185000	Tentelometer	Confirmation of Tape Tension on Playback

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the FF button on the set for more than 2 seconds.
(The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g–500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- Turn on the power and set to the STOP mode.
- Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
- While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig (**JG024A**) and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to $10(+2, -0)$ mm.
- Adjust the other reel in the same way.

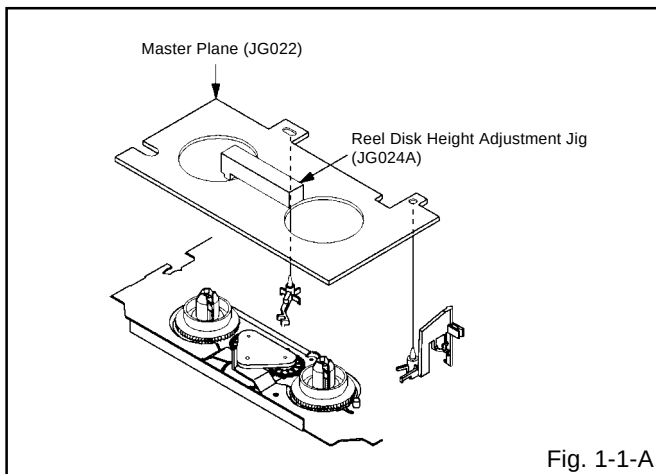


Fig. 1-1-A

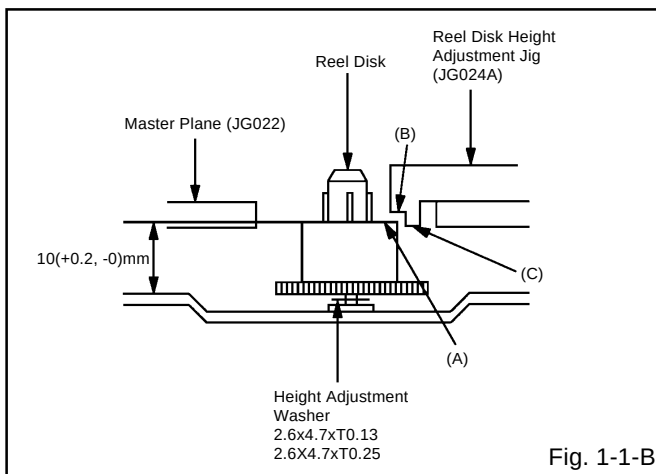


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

- Set to the PLAY mode.
- Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
- While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

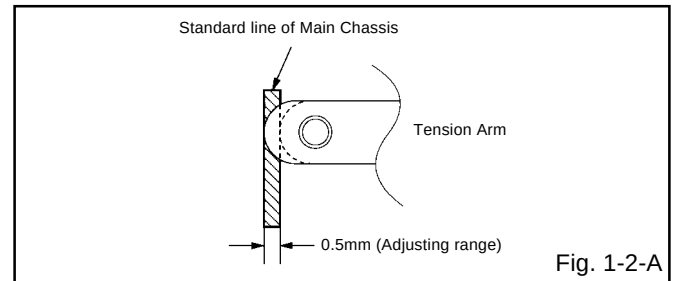


Fig. 1-2-A

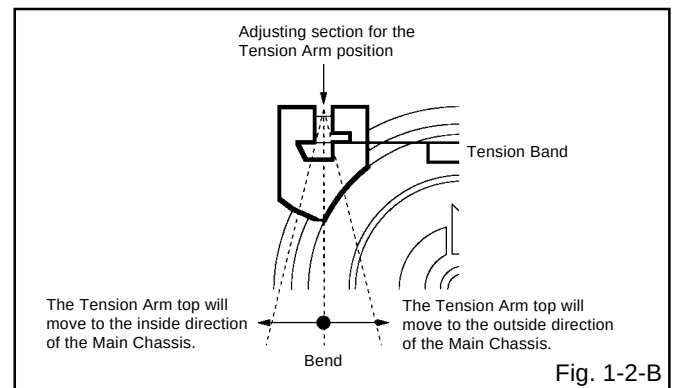


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

- Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer (JG185) as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2 gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE (KT-300NR)

- After confirmation and adjustment of Tension Post position (**Refer to item 1-2**), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
- Confirm that the right meter of the torque tape indicates $50 \sim 90$ gf•cm during playback in SP mode.
- Confirm that the left meter of the torque tape indicates $25 \sim 40$ gf•cm during playback in SP mode.

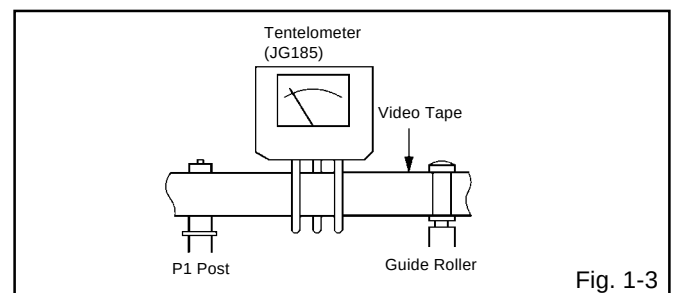


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Set to the Picture Search (Rewind) mode. (Refer to Fig.1-4-B)
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Turn the Torque Gauge (**JG002F**) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (**JG002E**) and Adapter (**JG002B**) on the T reel. Turn the Torque Gauge (**JG002E**) counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

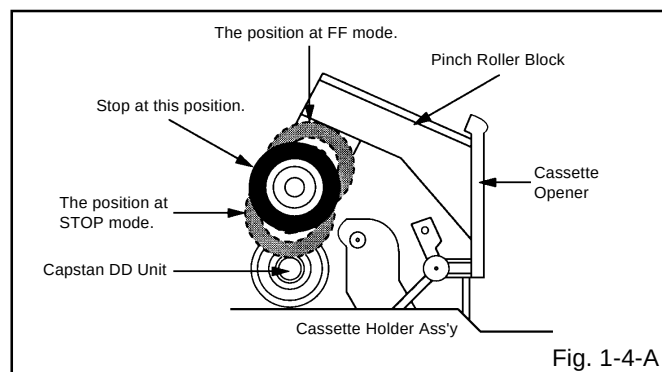


Fig. 1-4-A

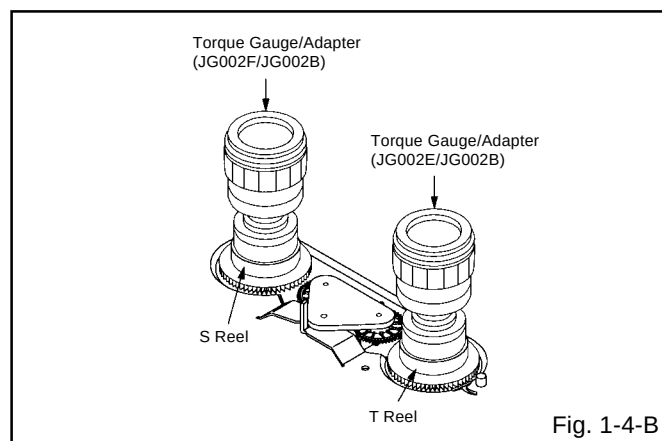


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4501 (Envelope)** and CH-2 to **TP102 (SW Pulse)**.
3. Press and hold the Digital Tracking button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat.
Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback.
(Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

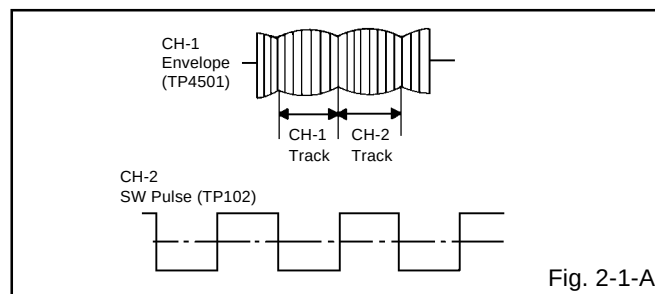


Fig. 2-1-A

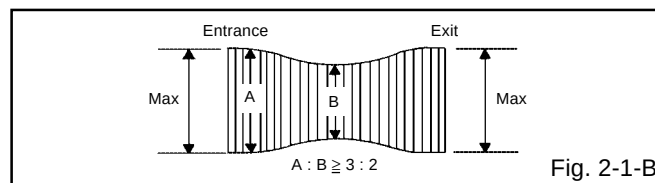


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
 - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
 - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
 - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

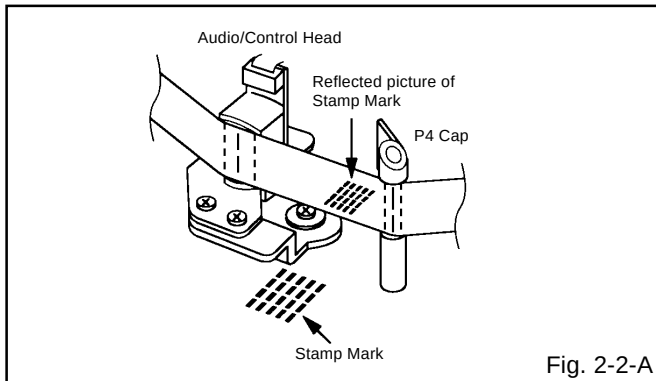


Fig. 2-2-A

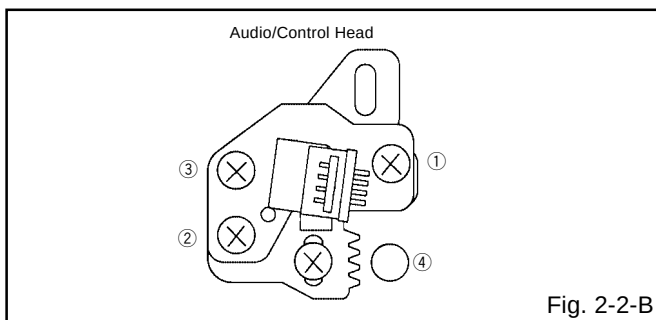


Fig. 2-2-B

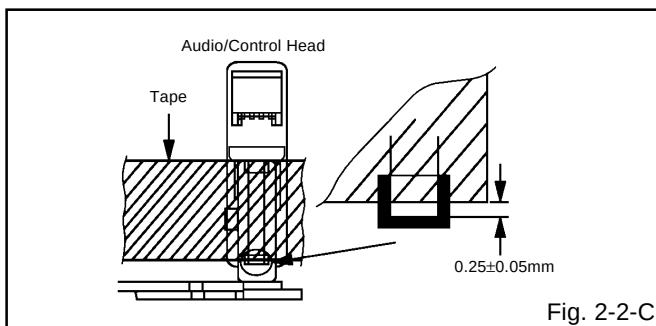


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk.
(Refer to item 1-1)
2. Confirm and adjust the position of the Tension Post.
(Refer to item 1-2)
3. Adjust the Guide Roller. (Refer to item 2-1)
4. Confirm and adjust the Audio/Control Head.
(Refer to item 2-2)
5. Connect CH-1 of the oscilloscope to **TP102**, CH-2 to **TP4501** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Digital Tracking button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

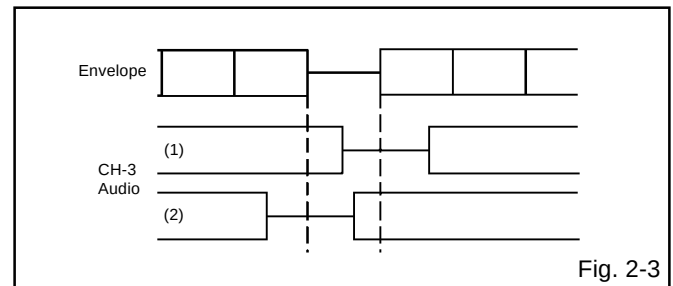
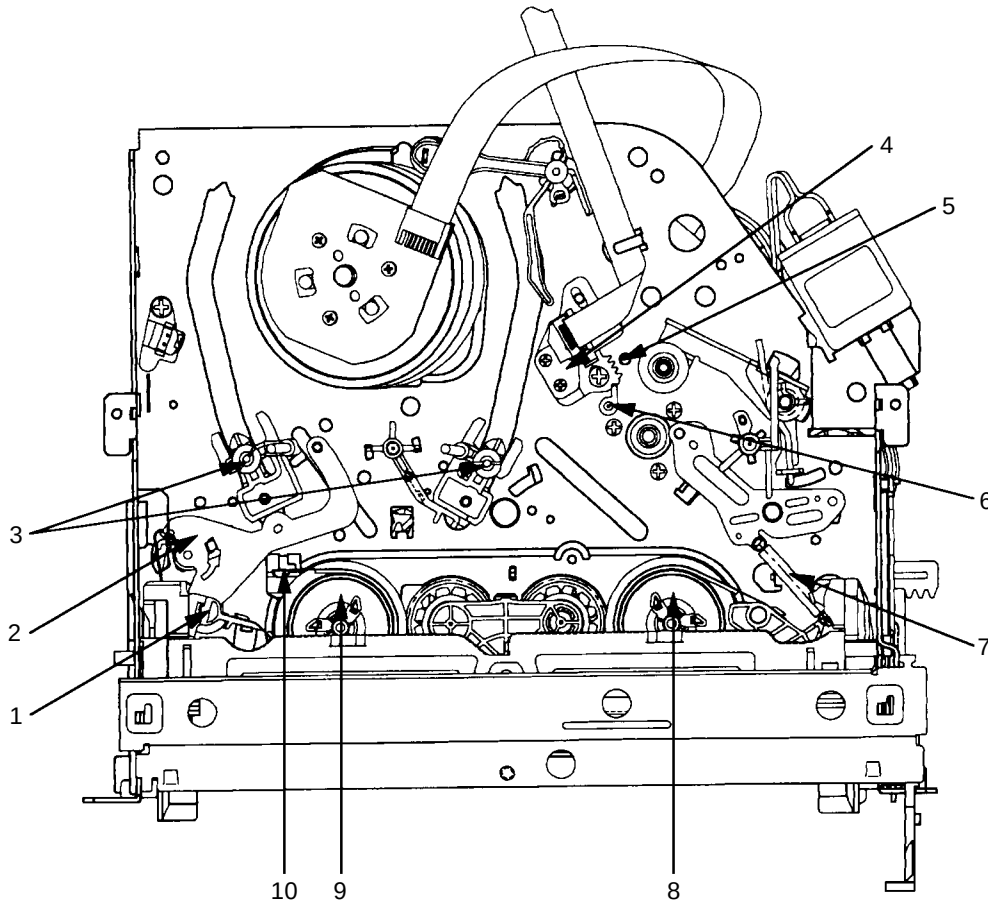


Fig. 2-3

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- | | |
|-----------------------------------|--|
| 1. Tension Connect | 6. P4 Post |
| 2. Tension Arm | 7. T Brake Spring |
| 3. Guide Roller | 8. T Reel |
| 4. Audio/Control Head | 9. S Reel |
| 5. X value adjustment driver hole | 10. Adjusting section for the Tension Arm position |

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor).

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button (9) on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in Fig. 1-1.

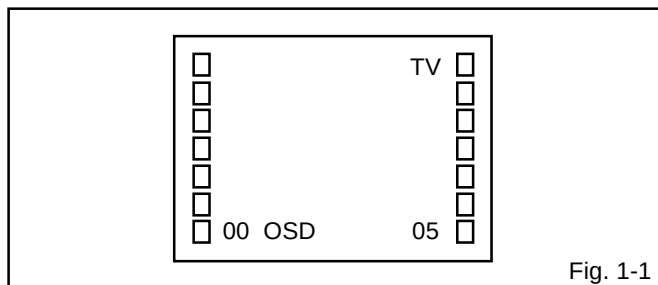


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button (0-9) on the remote control to select the options shown in Fig. 1-2.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	18	BRI MAX
01	OSD C	19	BRI MIN
02	CUT OFF	20	CONT CENT
03	H.POSI	21	CONT MAX
04	H.BLK L	22	CONT MIN
05	H.BLK R	23	COL CENT
06	V.SIZE	24	COL MAX
07	V.POSI	25	COL MIN
08	V.LIN	26	TINT
09	VS.CORR	27	SHARP
10	V.COMP	28	SUB BIAS
11	R.BIAS	29	H.SIZE
12	G.BIAS	30	PARABOLA
13	B.BIAS	31	TRAPEZIUM
14	R.DRV	32	COR TOP
15	G.DRV	33	COR BTM
16	B.DRV	34	H.COMP
17	BRI CENT	35	T.STE
		38	H.FREQ

Fig. 1-2

2. BASIC ADJUSTMENTS

(VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to TP102 and CH-2 to pin 4 of TP4201.
2. Playback the alignment tape.(JG001P)
3. Press both VOL. DOWN button on the set and the Channel button (5) on the remote control for more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button (3) on the remote control for more than 2 seconds until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button (3) on the remote control for more than 2 seconds until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button (4) on the remote control for more than 2 seconds and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes $6.5 \pm 0.5H$.
(Refer to Fig. 2-1-A, B)

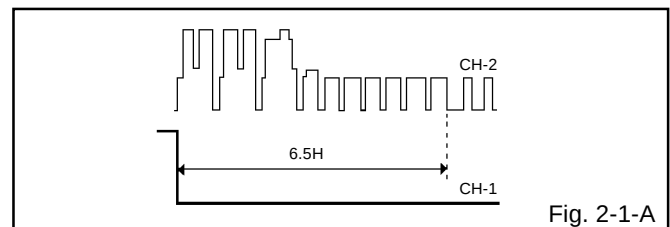


Fig. 2-1-A

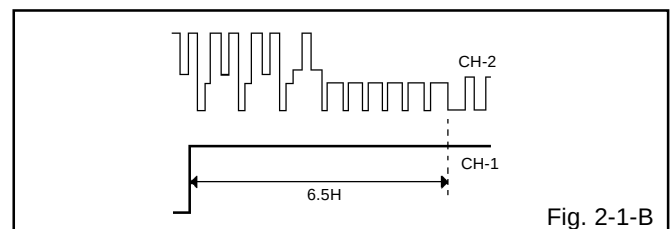


Fig. 2-1-B

ELECTRICAL ADJUSTMENTS

(TV SECTION)

2-2: CONSTANT VOLTAGE

1. Place the set in AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Connect the digital voltmeter to **TP401** and **HS402**.
4. Adjust the **VR404** until the digital voltmeter is $115 \pm 0.5V$.

2-3: CUT OFF

1. Adjust the unit to the following settings.
BRI. CENTER=127, CONT MAX=100, R.BIAS=64,
G.BIAS=64, B.BIAS=64, R.DRV=63, G.DRV=07,
B.DRV=63.
2. Place the set in Aging Test for more than 15 minutes.
3. Place the set in AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-4: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(11)** on the remote control to select "R.BIAS".
5. Press the CH. UP/DOWN button on the remote control to select the "R.BIAS", "G.BIAS", "B.BIAS", "R.DRV", "B.DRV" or "G.DRV".
6. Adjust the LEFT/RIGHT button on the remote control to whiten the R.BIAS, G.BIAS, B.BIAS, R.DRV, B.DRV, and G.DRV at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is achieved.

2-5: FOCUS

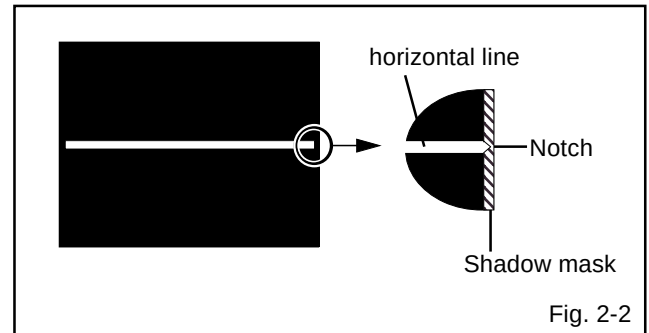
1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-6: HORIZONTAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "H.POSI".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-7: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V.POSI".
4. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask. (**Refer fo Fig.2-2**)



2-8: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V.SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.

2-9: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-9.
After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select "V.LIN".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

ELECTRICAL ADJUSTMENTS

2-10: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum.
(Refer to **Fig. 2-3**)

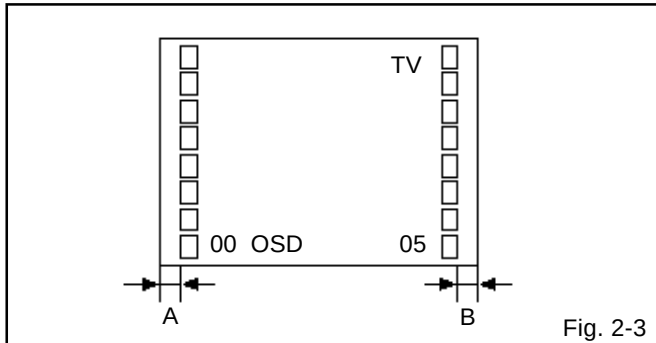


Fig. 2-3

2-11: BRIGHT CENTER

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (17) on the remote control to select "BRI CENT".
2. Press the VOL. UP/DOWN button on the remote control until the screen begin to shine.
3. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 1, 2.
4. Press the DVD button on the remote control to set to the DVD mode.
Activate the adjustment mode display of **Fig. 1-1** and
5. press the channel button (17) on the remote control to select "BRI CENT".
6. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-12: TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP803**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (26) on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line
(Refer to **Fig. 2-4**).
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.
8. Press the DVD button on the remote control to set to the DVD mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (26) on the remote control to select "TINT".
10. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "66".

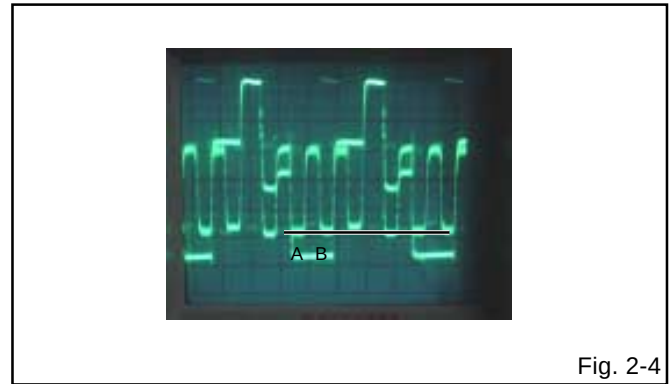


Fig. 2-4

2-13: COLOR CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP802**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (23) on the remote control to select "COL CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $100 \pm 5\%$ of the white level. (Refer to **Fig. 2-5**)
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.
9. Press the DVD button on the remote control to set to the DVD mode.
10. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (23) on the remote control to select "COL CENT".
11. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

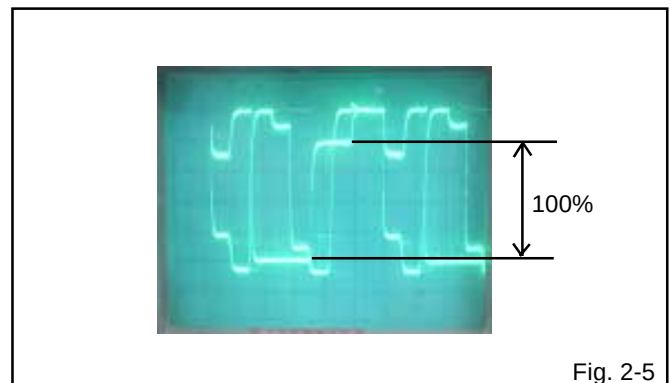


Fig. 2-5

ELECTRICAL ADJUSTMENTS

2-14: CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "CONT MAX".
2. Press the LEFT/RIGHT button on the remote control until the contrast step No. becomes "70".
3. Receive a broadcast and check if the picture is normal.
4. Press the INPUT SELECT button on the remote control to set to the AV mode.
5. Press the DVD button on the remote control to set to the DVD mode.
Activate the adjustment mode display of **Fig. 1-1** and
6. press the channel button **(21)** on the remote control to select "CONT MAX".
7. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-15: Confirmation of Fixed Value (step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	RF	AV	DVD
01	OSD C	04	04	04
04	H.BLK L	02	02	02
05	H.BLK R	02	02	02
07	V.POSI	00	00	00
09	VS.CORR	07	07	07
10	V.COMP	03	03	03
15	G.DRV	07	07	07
18	BRI MAX	120	120	120
19	BRI MIN	45	45	45
20	CONT CENT	40	40	40
22	CONT MIN	05	05	05
24	COL MAX	127	127	127
25	COL MIN	00	00	00
28	SUB BIAS	20	20	20
29	H.SIZE	00	00	00
30	PARABOLA	00	00	00
31	TRAPEZIUM	00	00	00
32	COR TOP	00	00	00
33	COR BTM	00	00	00
34	H.COMP	00	00	00
35	T.STE	00	00	00

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

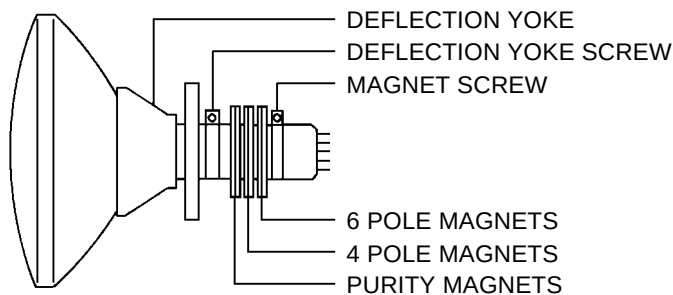


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

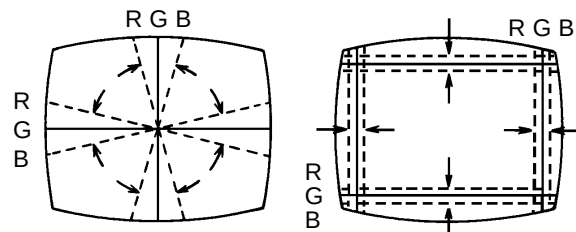
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

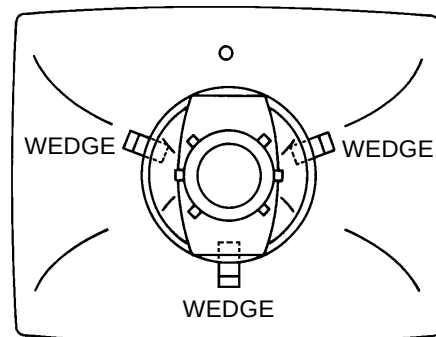
NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
(Refer to Fig. 3-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
(Refer to Fig. 3-2-b)



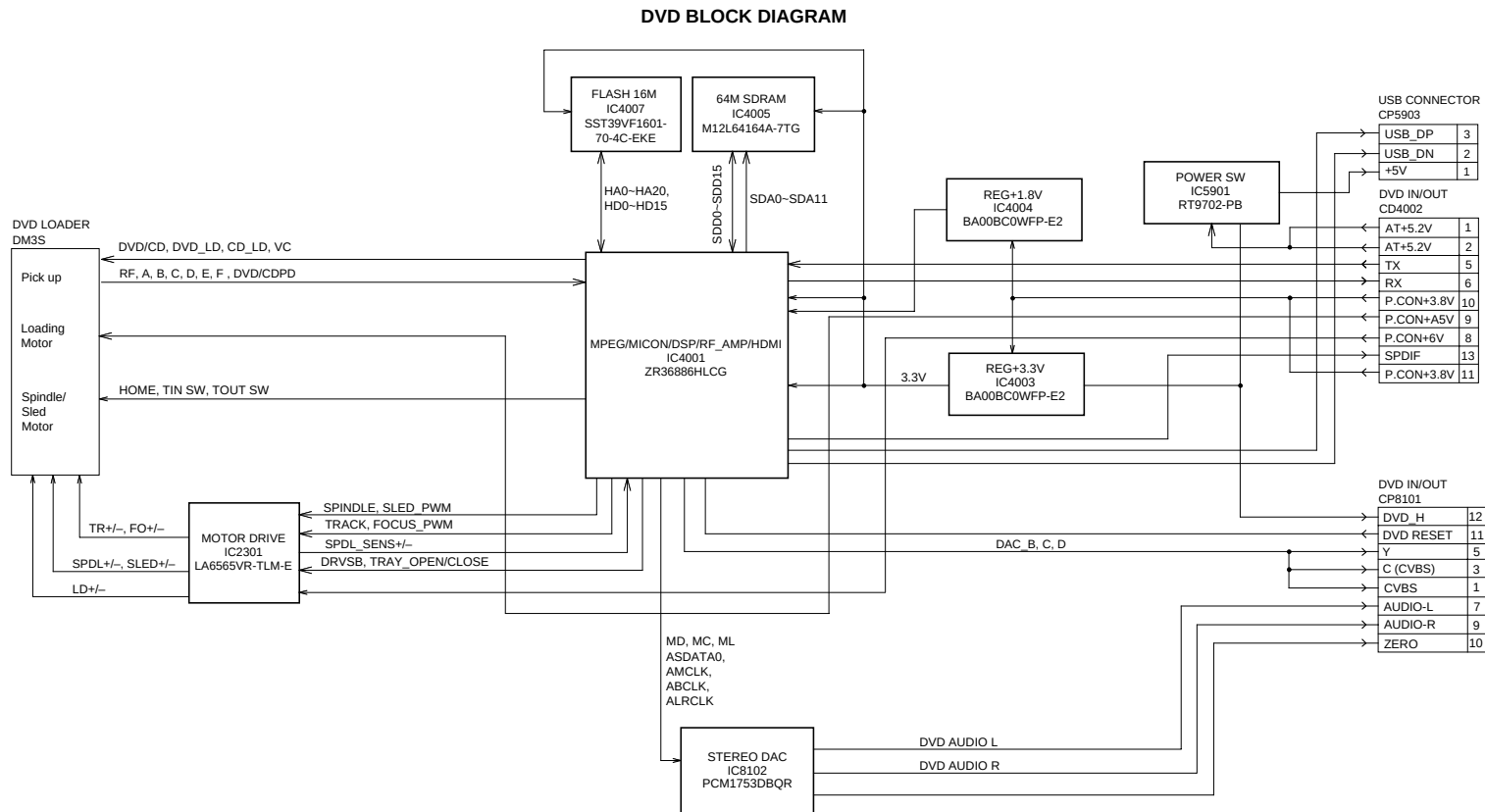
UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT
Fig. 3-2-a



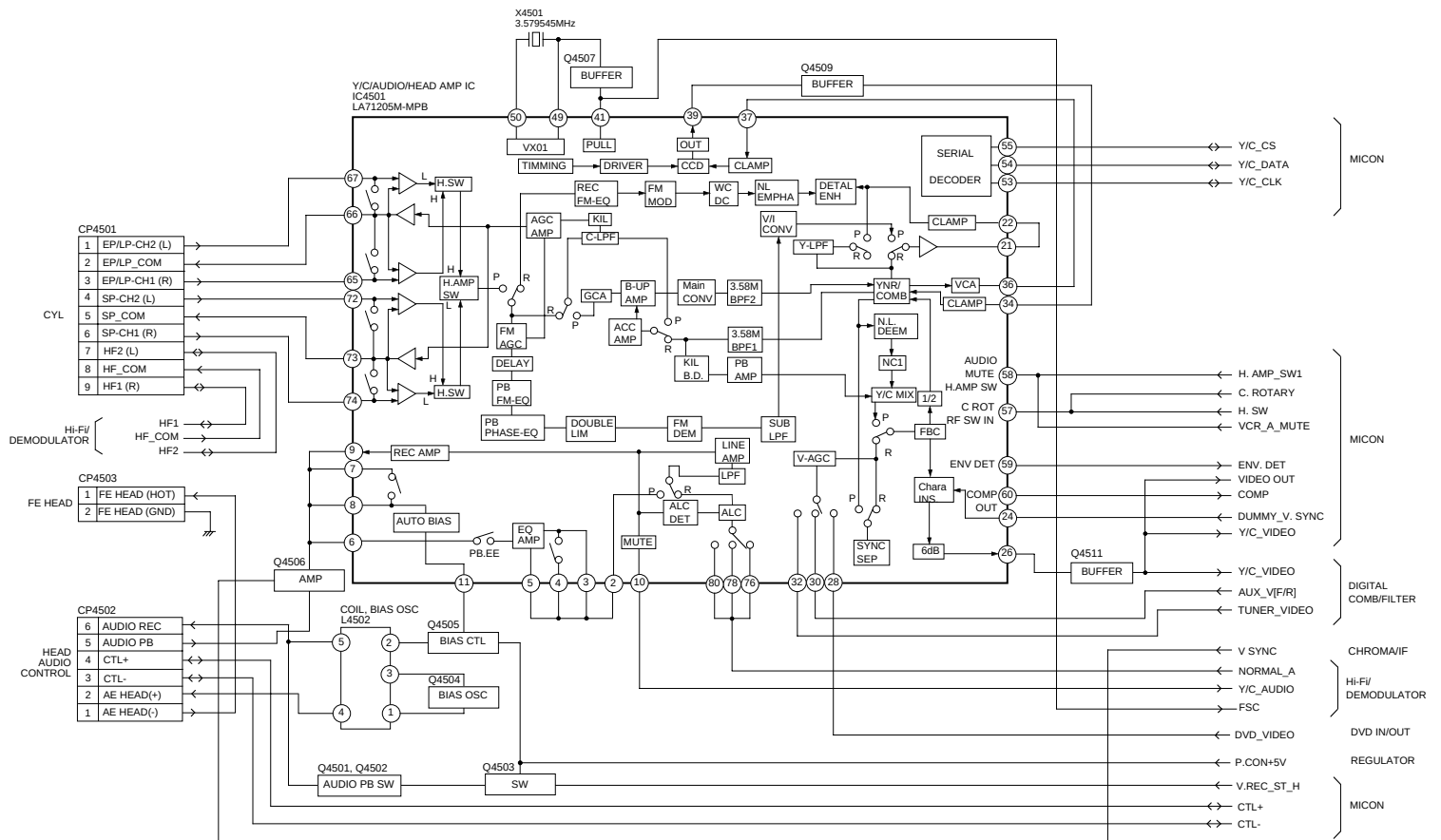
WEDGE POSITION
Fig. 3-2-b

4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)

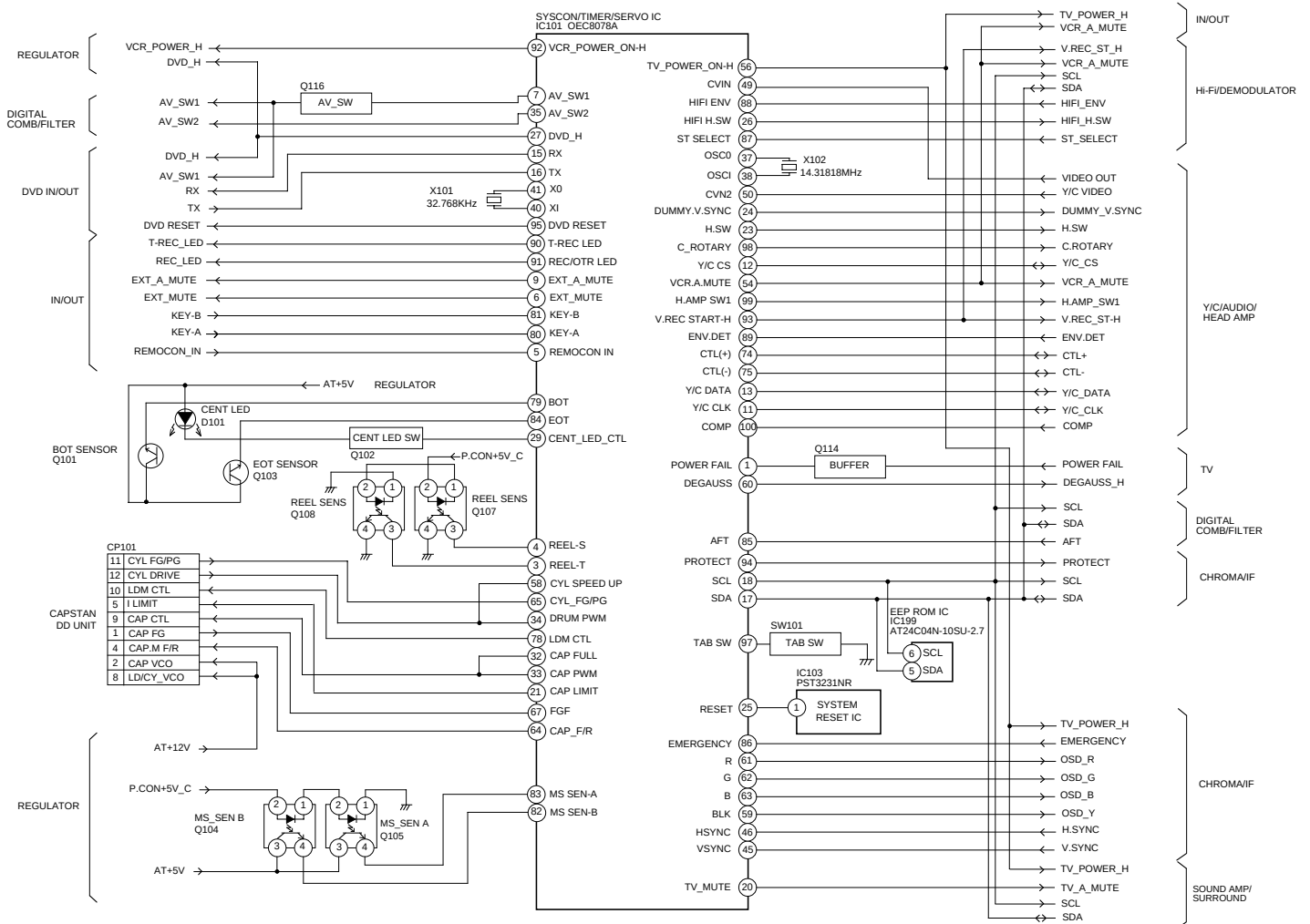




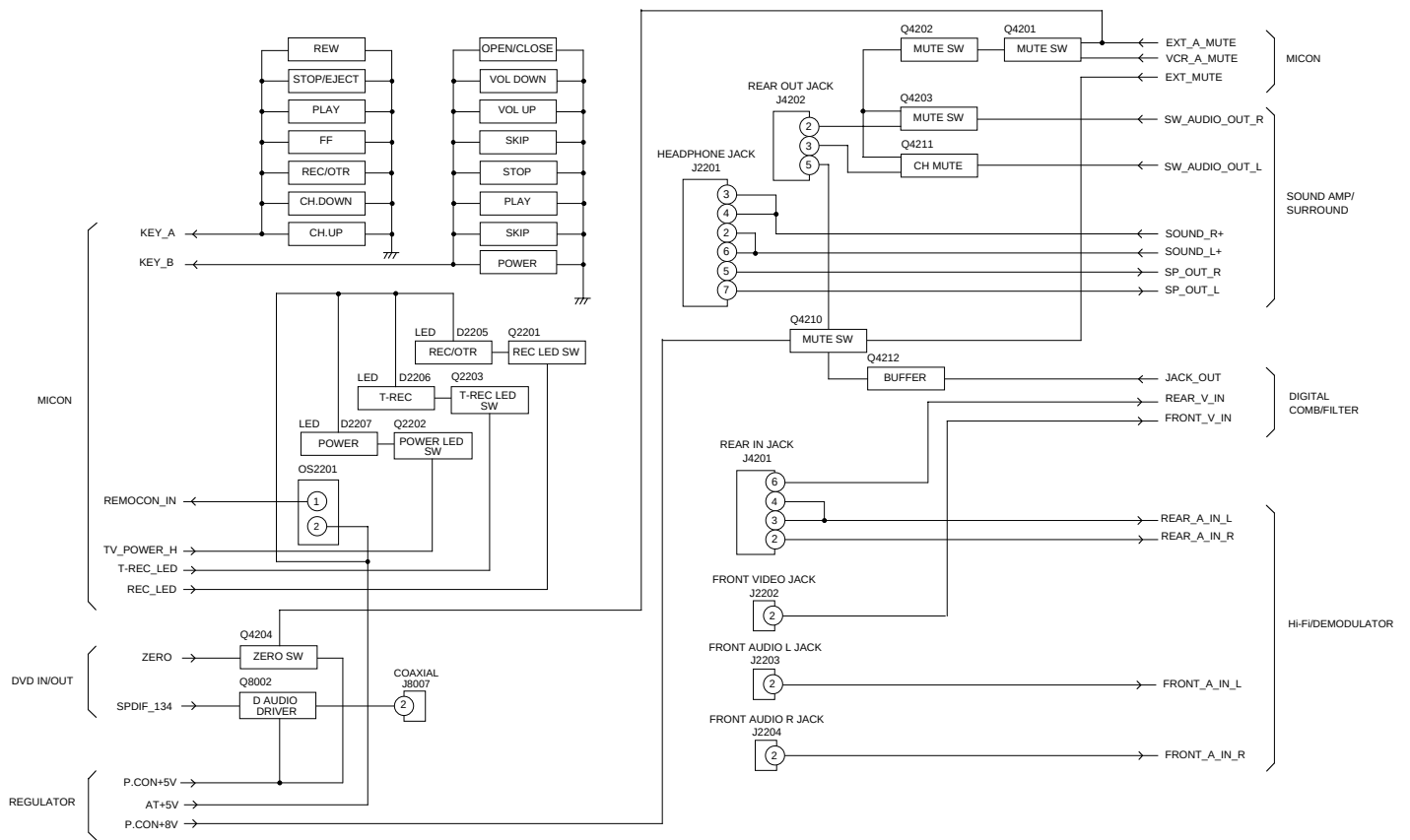
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



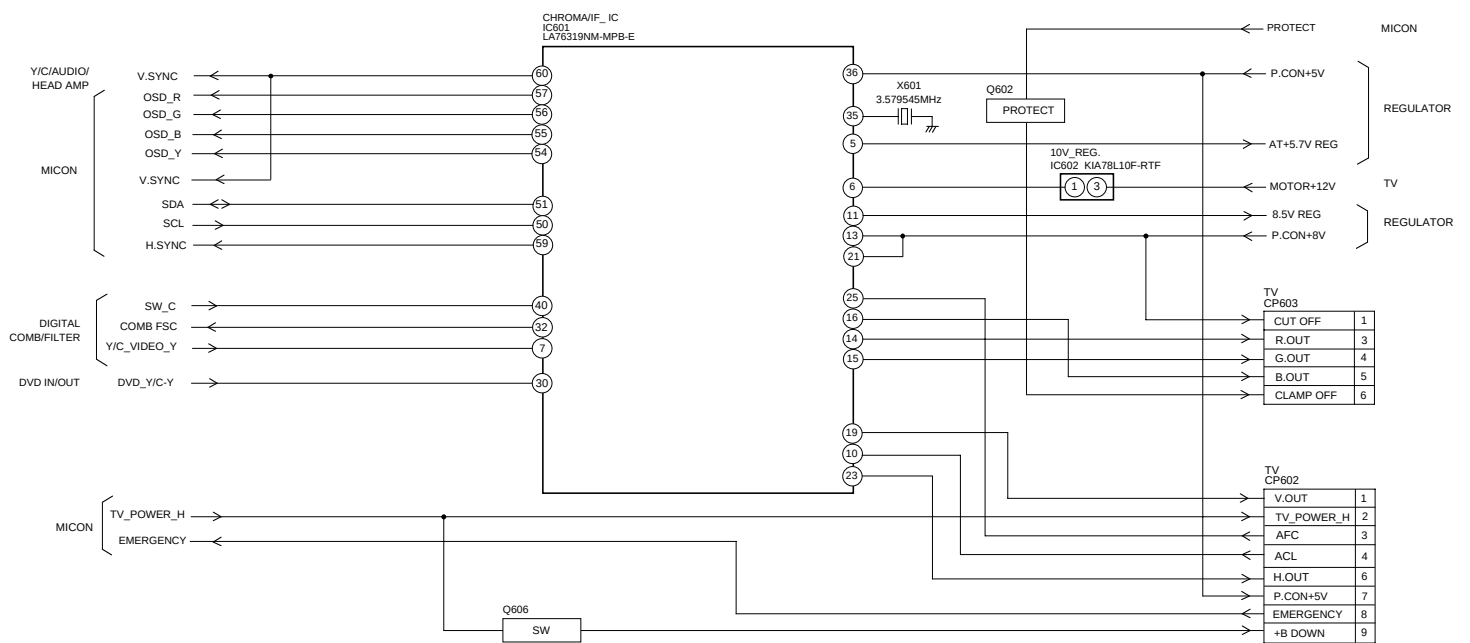
MICON BLOCK DIAGRAM



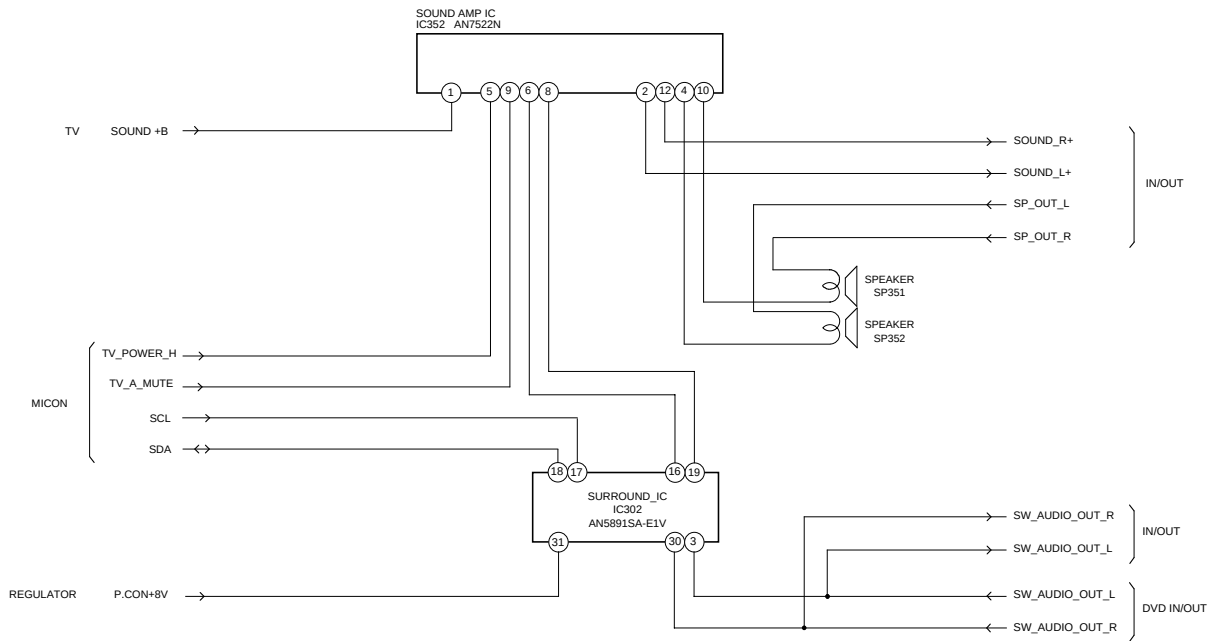
IN/OUT BLOCK DIAGRAM



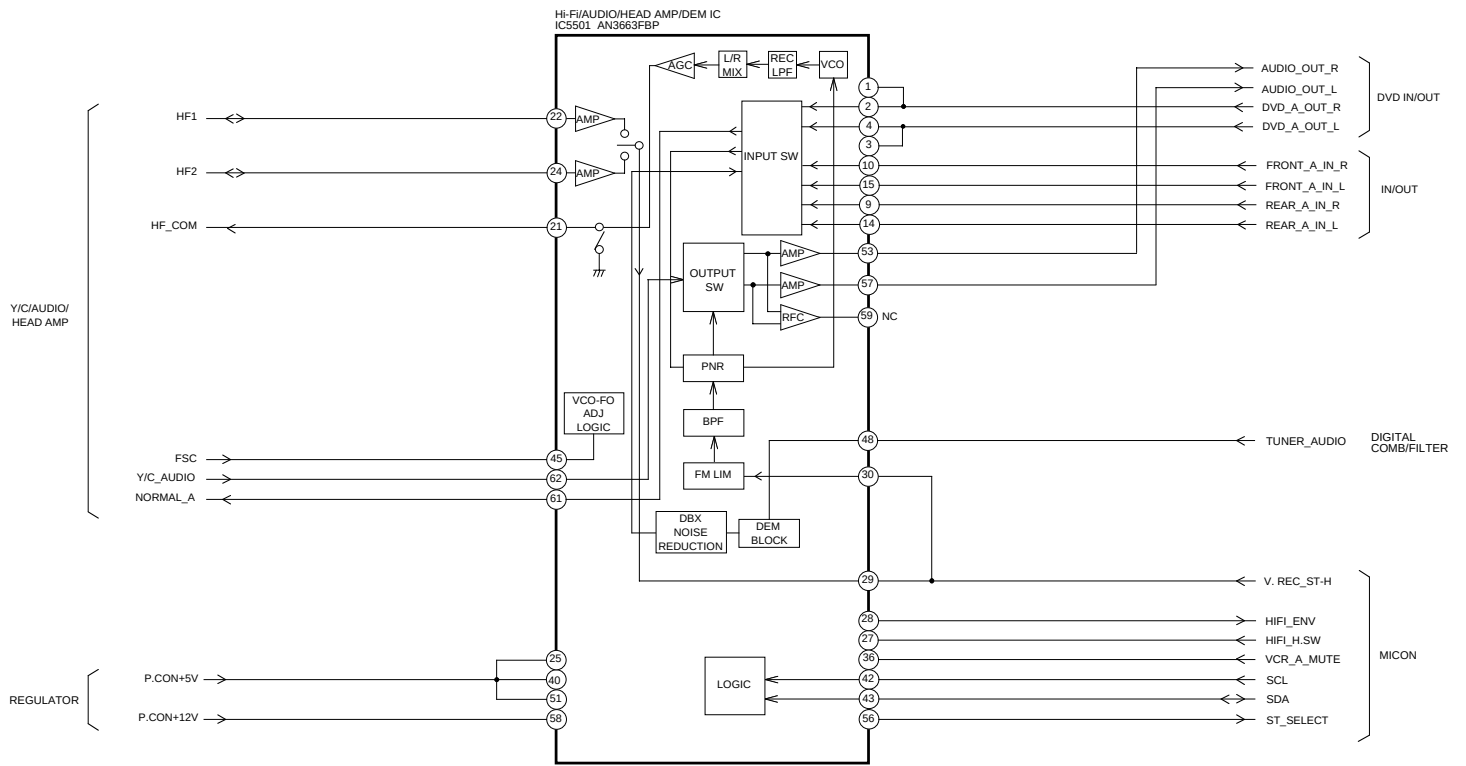
CHROMA/IF BLOCK DIAGRAM



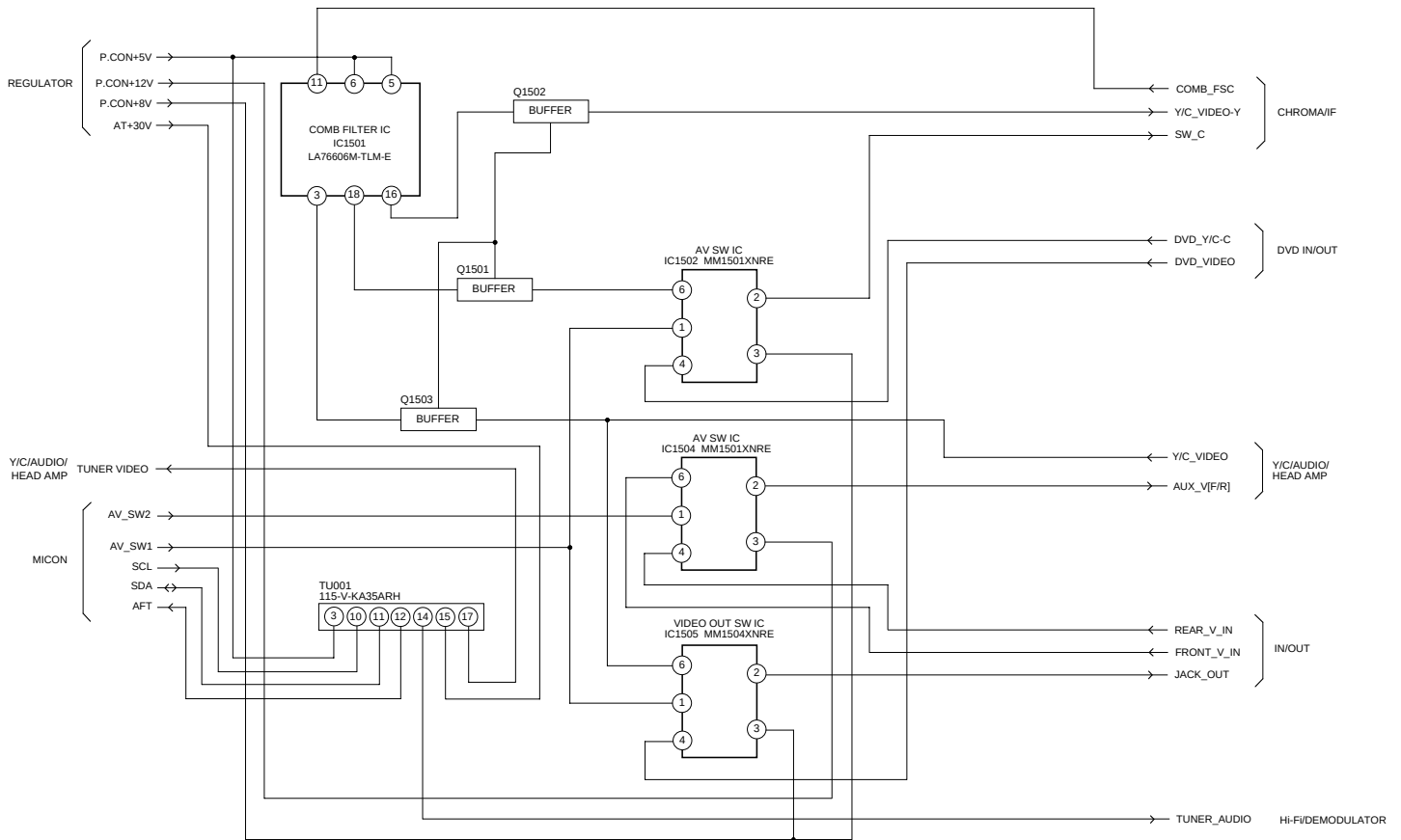
SOUND AMP/SURROUND BLOCK DIAGRAM



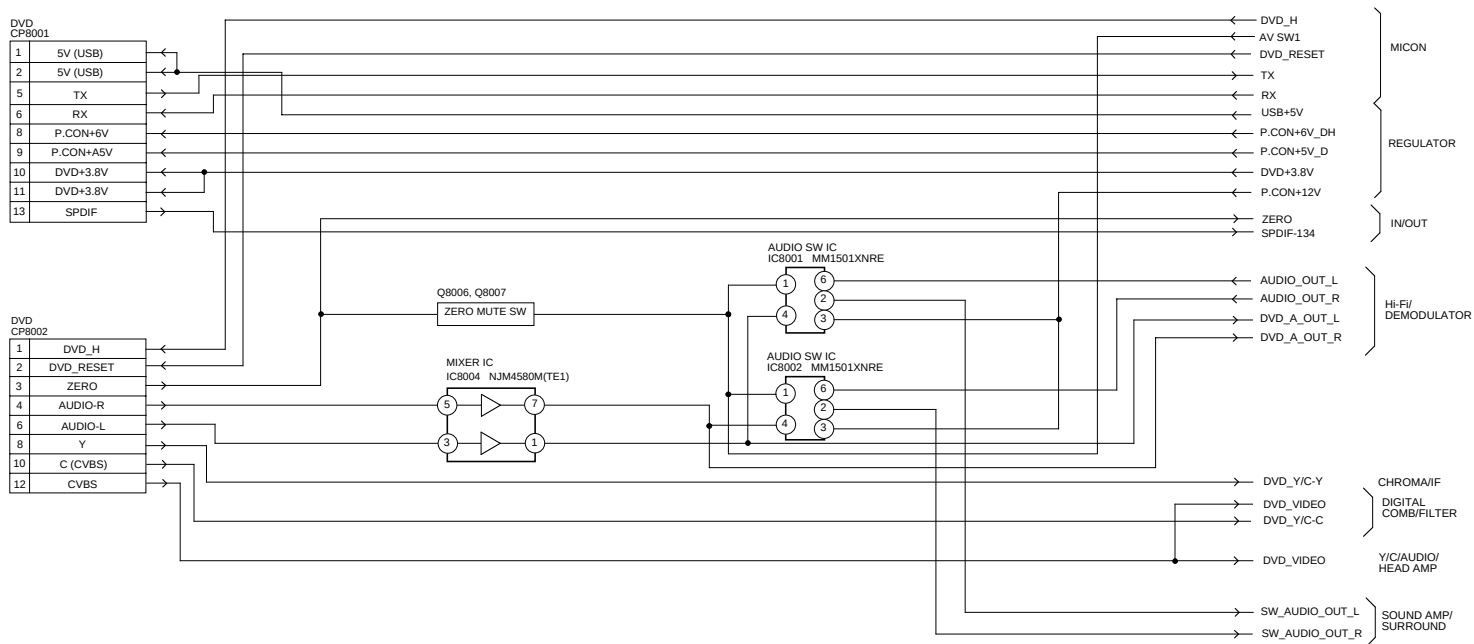
Hi-Fi/DEMODULATOR BLOCK DIAGRAM



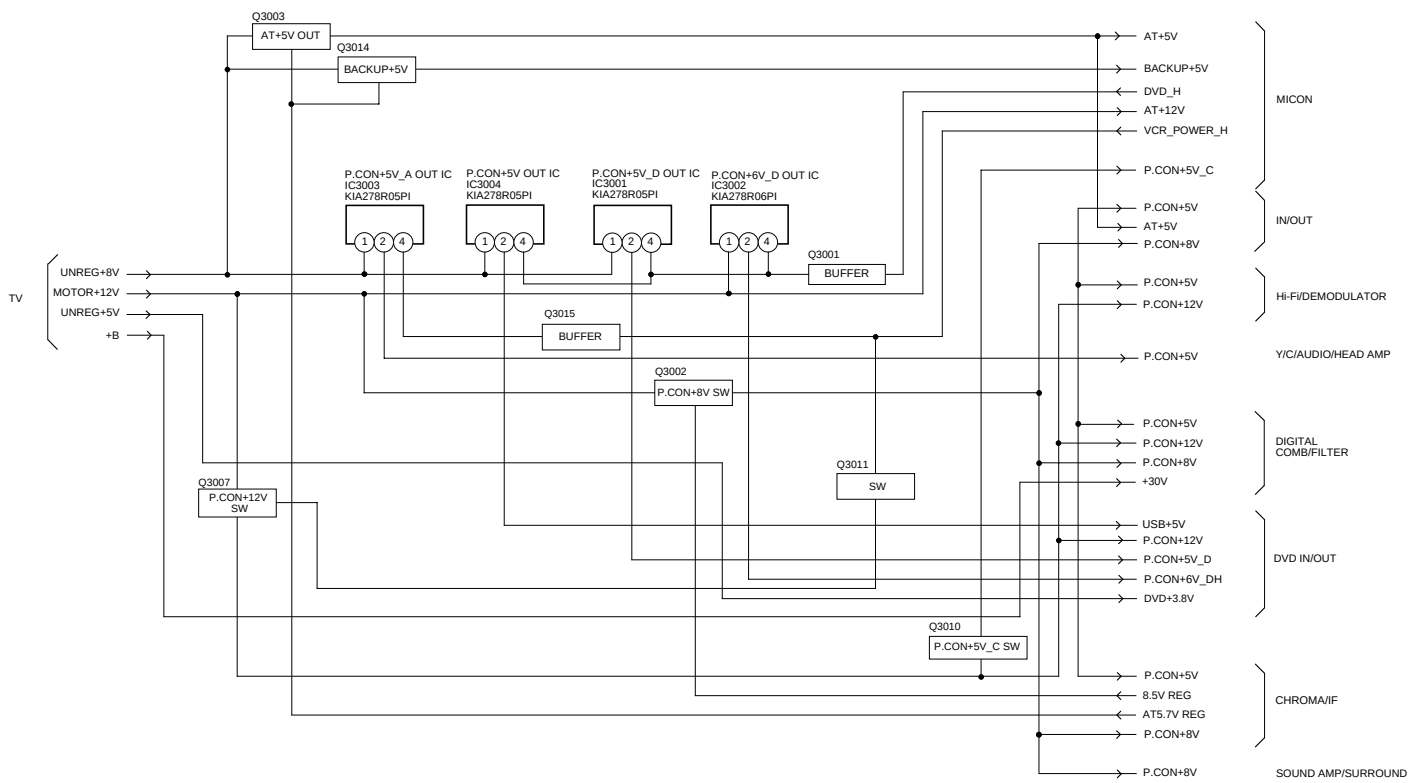
DIGITAL COMB/FILTER BLOCK DIAGRAM



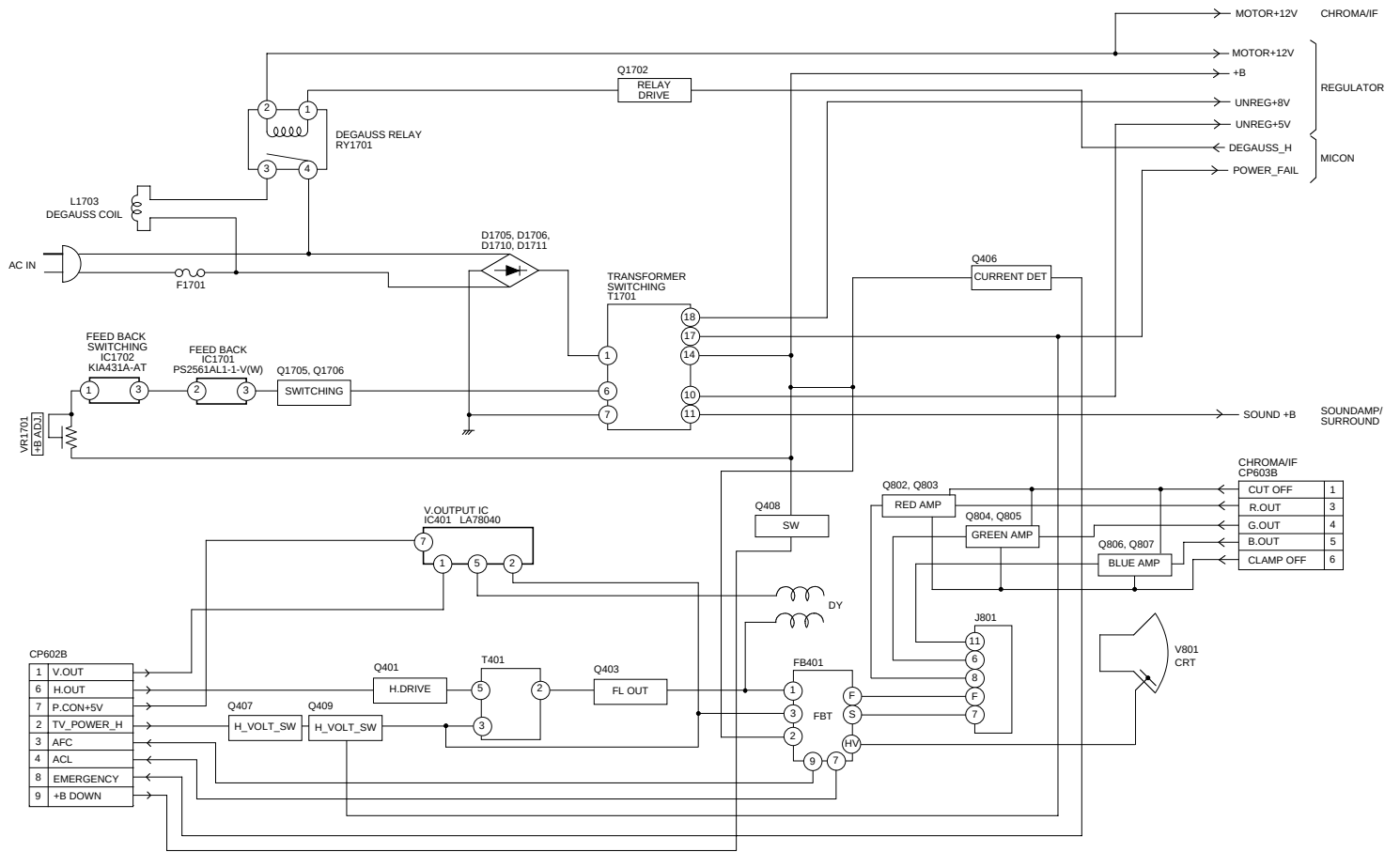
DVD IN/OUT BLOCK DIAGRAM



REGULATOR BLOCK DIAGRAM

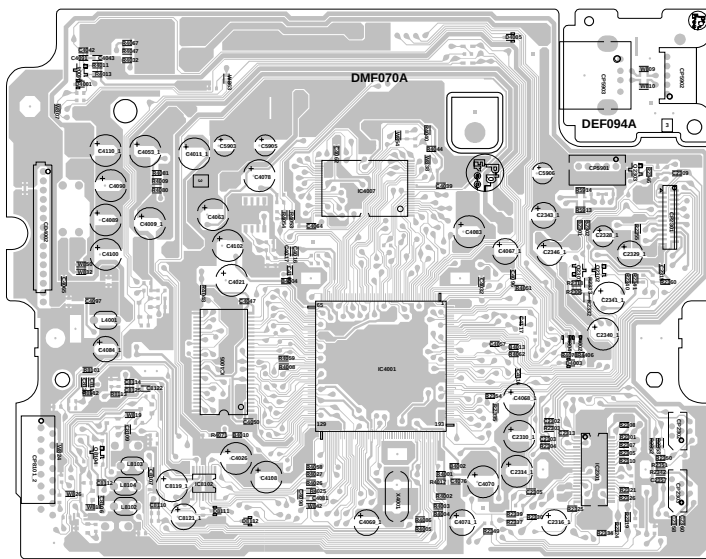


TV BLOCK DIAGRAM

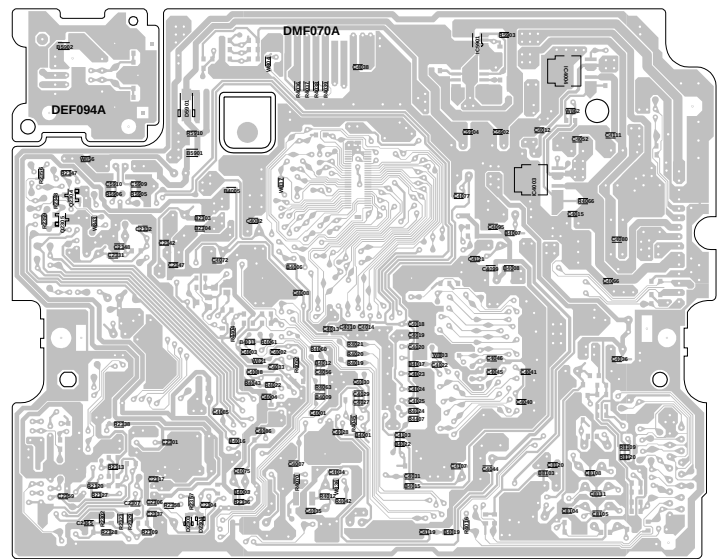


PRINTED CIRCUIT BOARDS

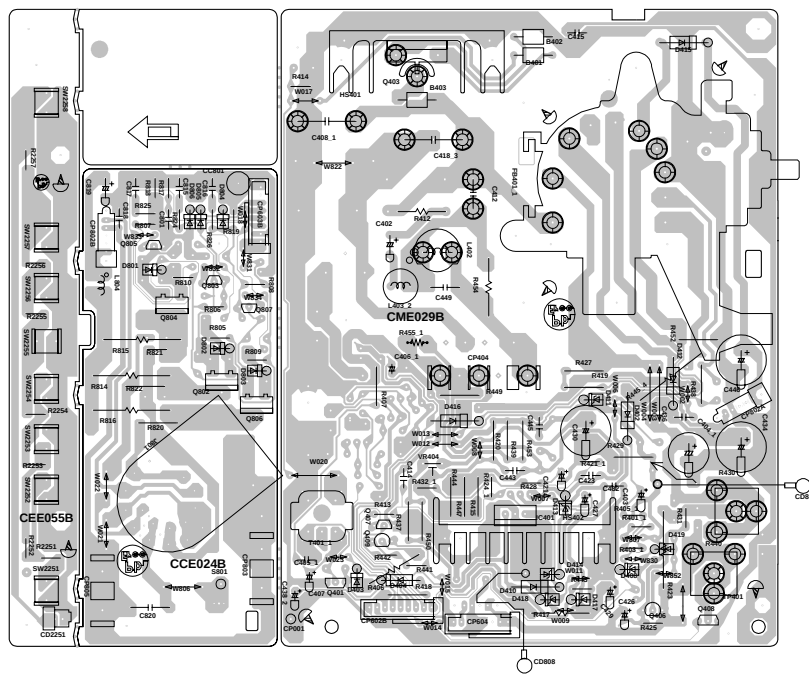
DVD/USB (TOP SIDE)



DVD/USB (BOTTOM SIDE)

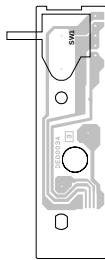


**PRINTED CIRCUIT BOARDS
DEFLECTION/CRT/OPERATION
SOLDER SIDE**

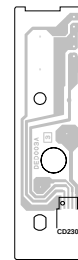


PRINTED CIRCUIT BOARDS

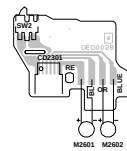
**LOADING MOTOR (INSERTED PARTS)
SOLDER SIDE**



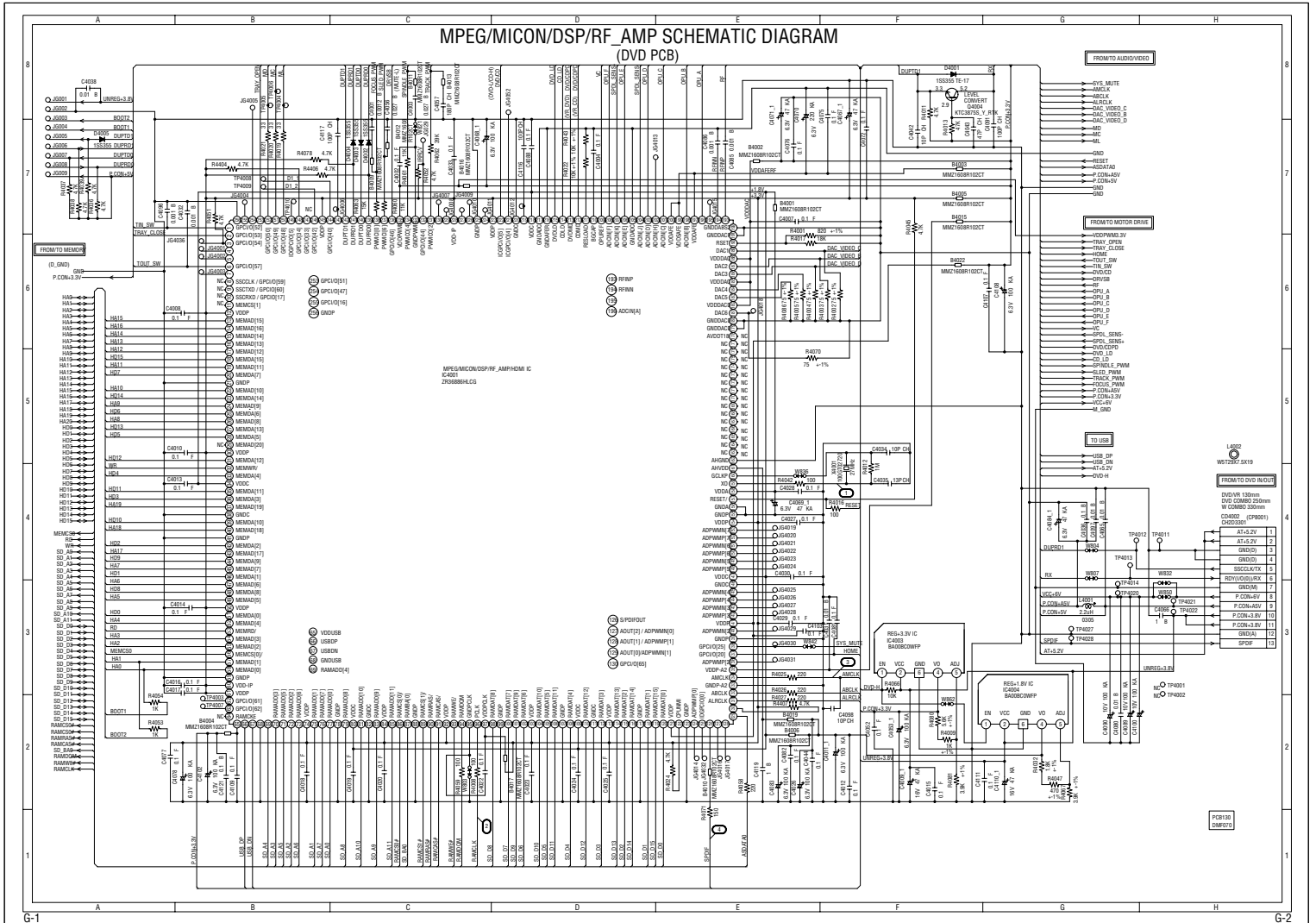
**LOADING MOTOR (CHIP MOUNTED PARTS)
SOLDER SIDE**



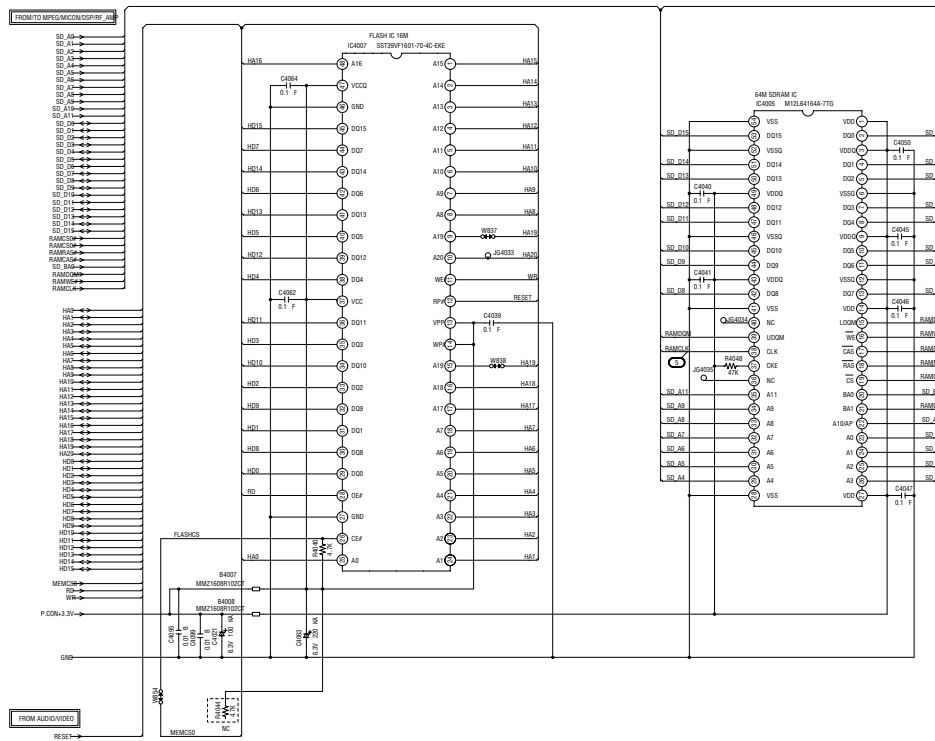
**SW
SOLDER SIDE**



MPEG/MICON/DSP/RF AMP SCHEMATIC DIAGRAM (DVD PCB)



MEMORY SCHEMATIC DIAGRAM (DVD PCB)

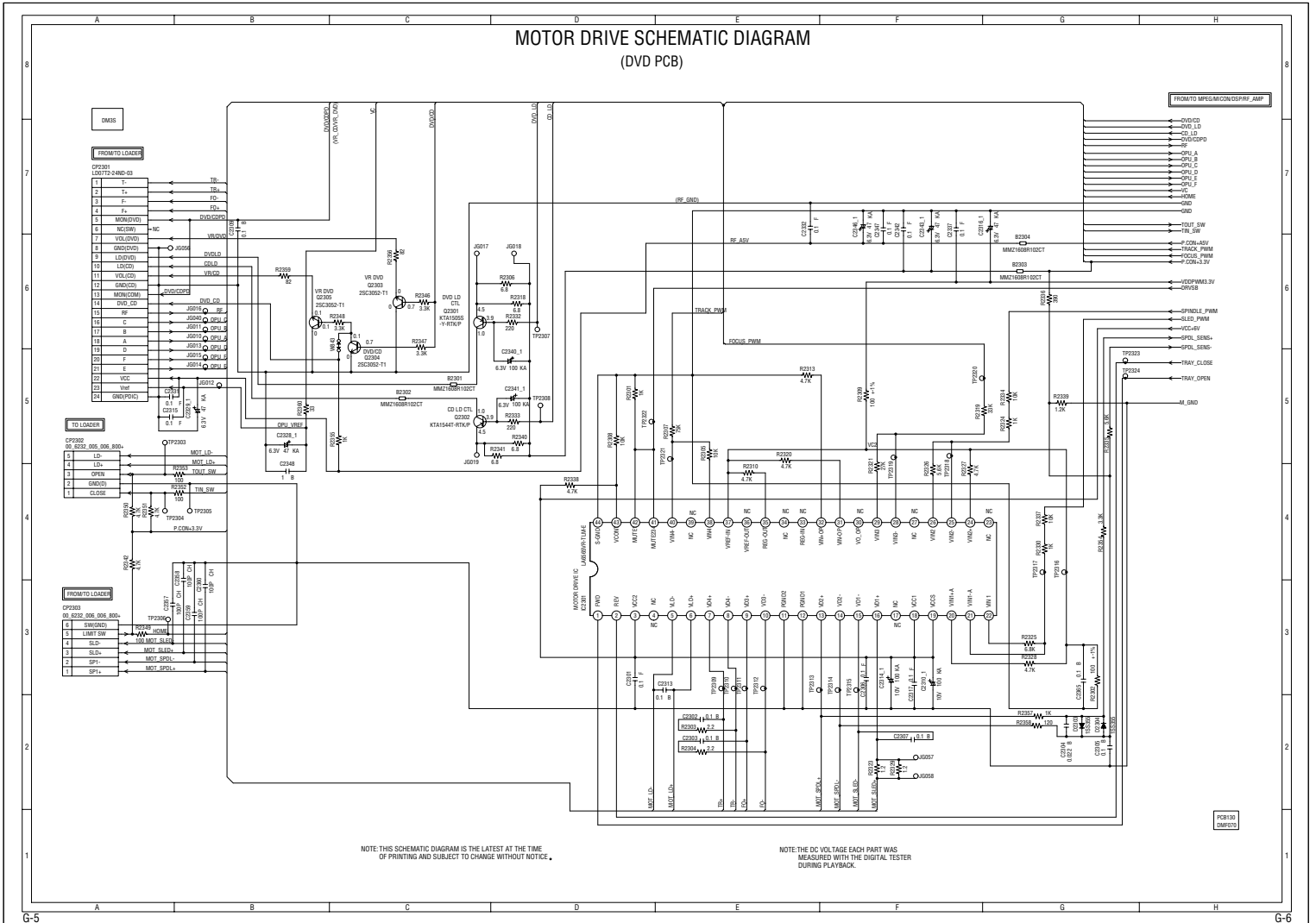


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

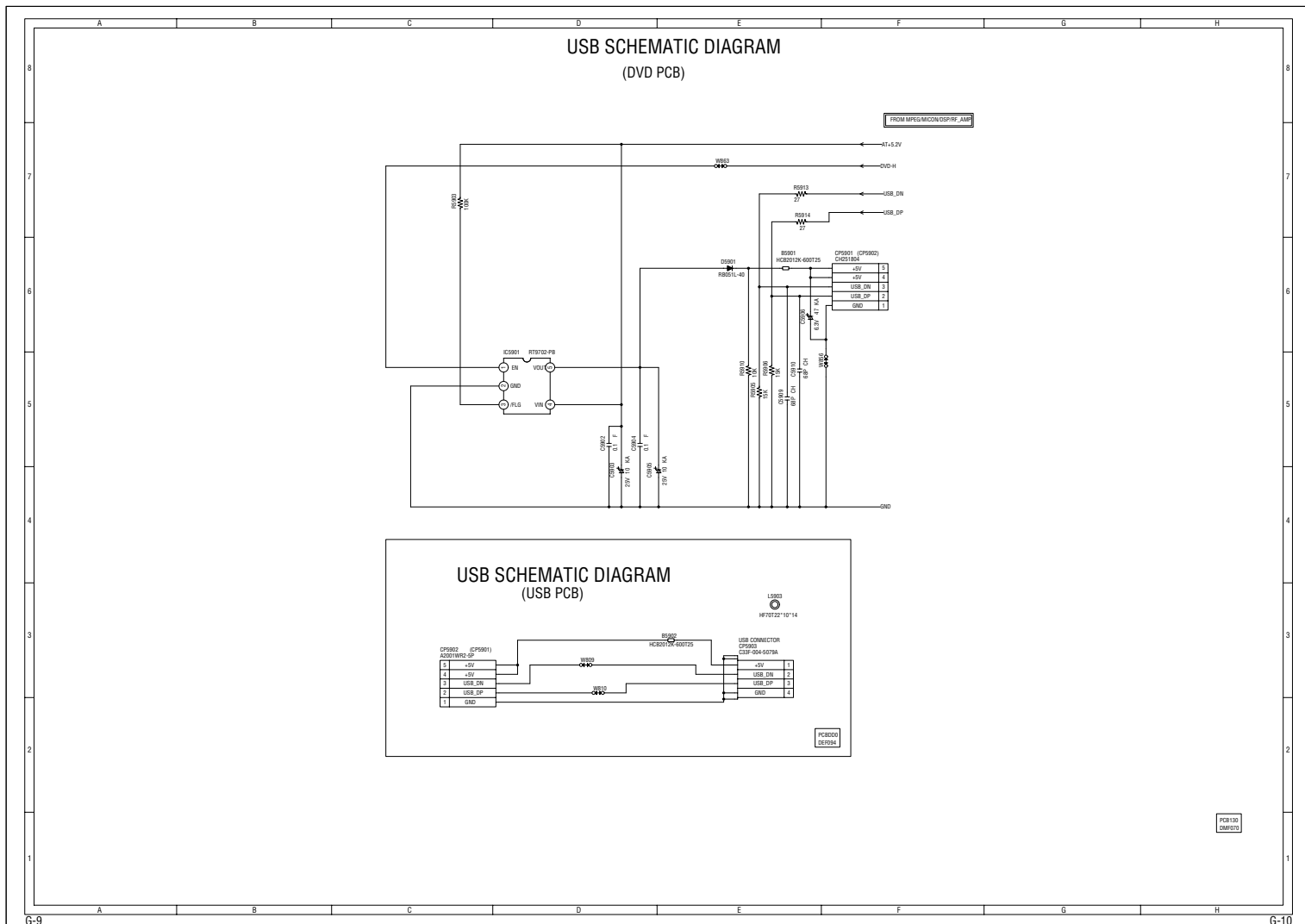
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB150
DMF070

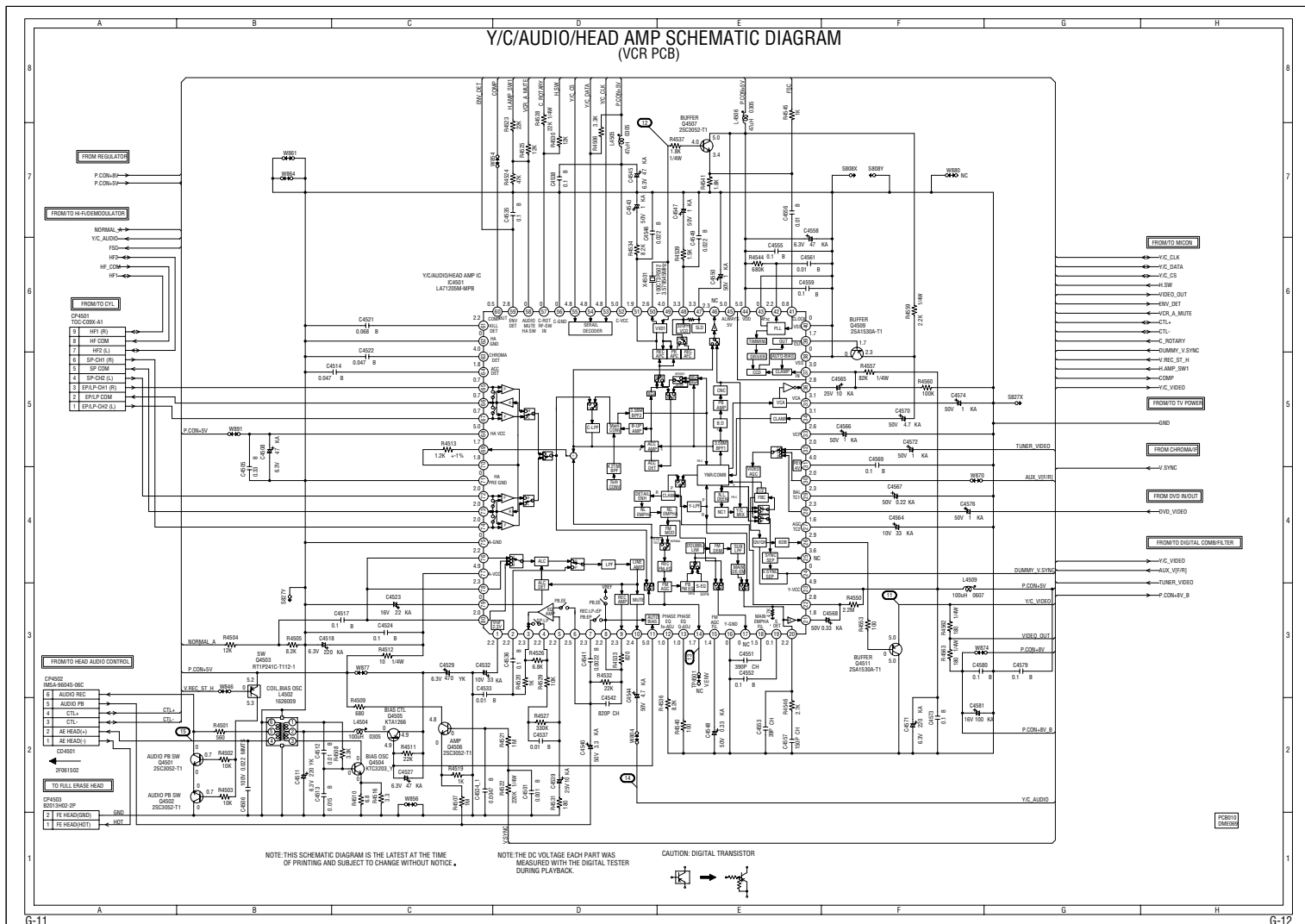
MOTOR DRIVE SCHEMATIC DIAGRAM (DVD PCB)







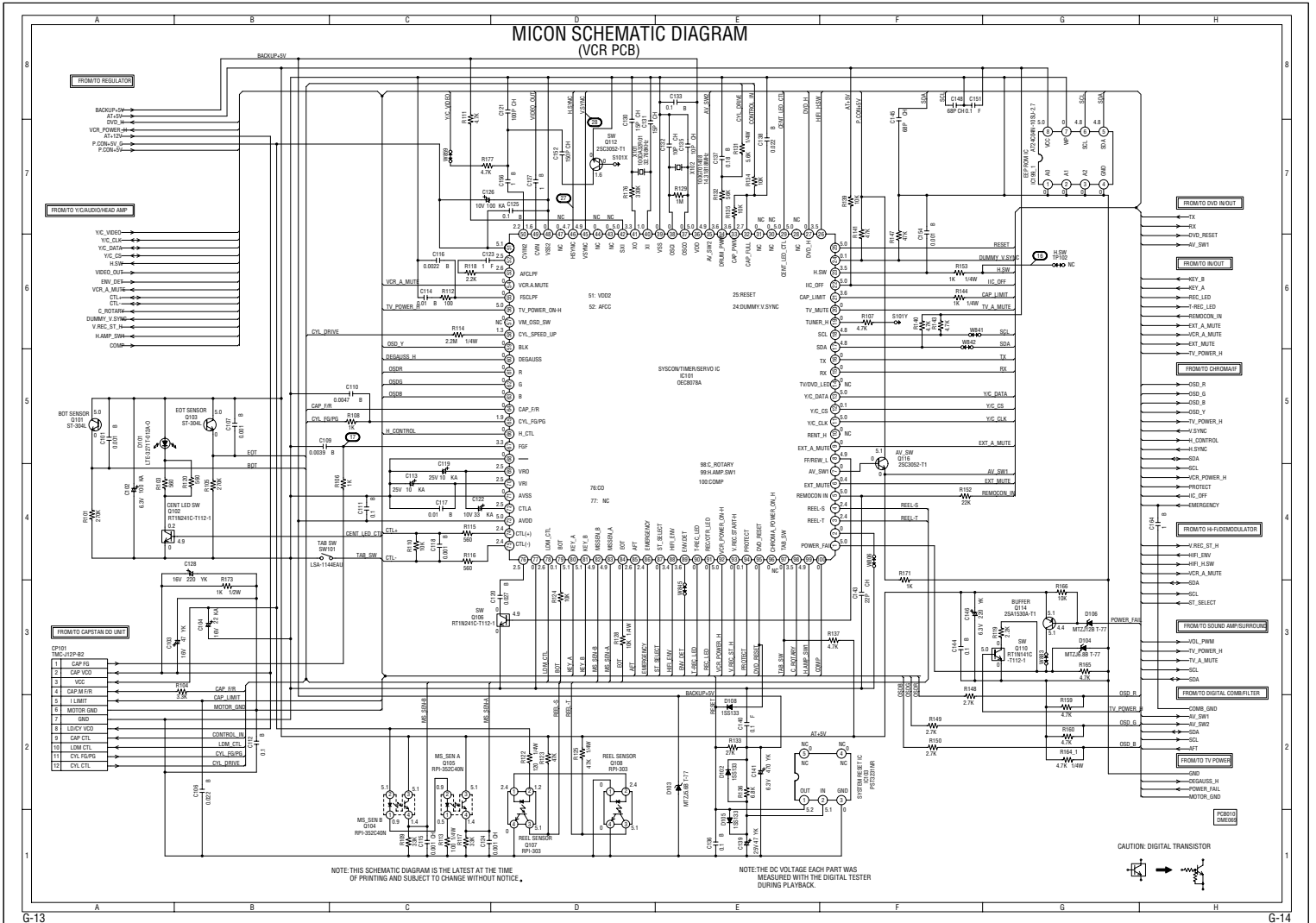
Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (VCR PCB)



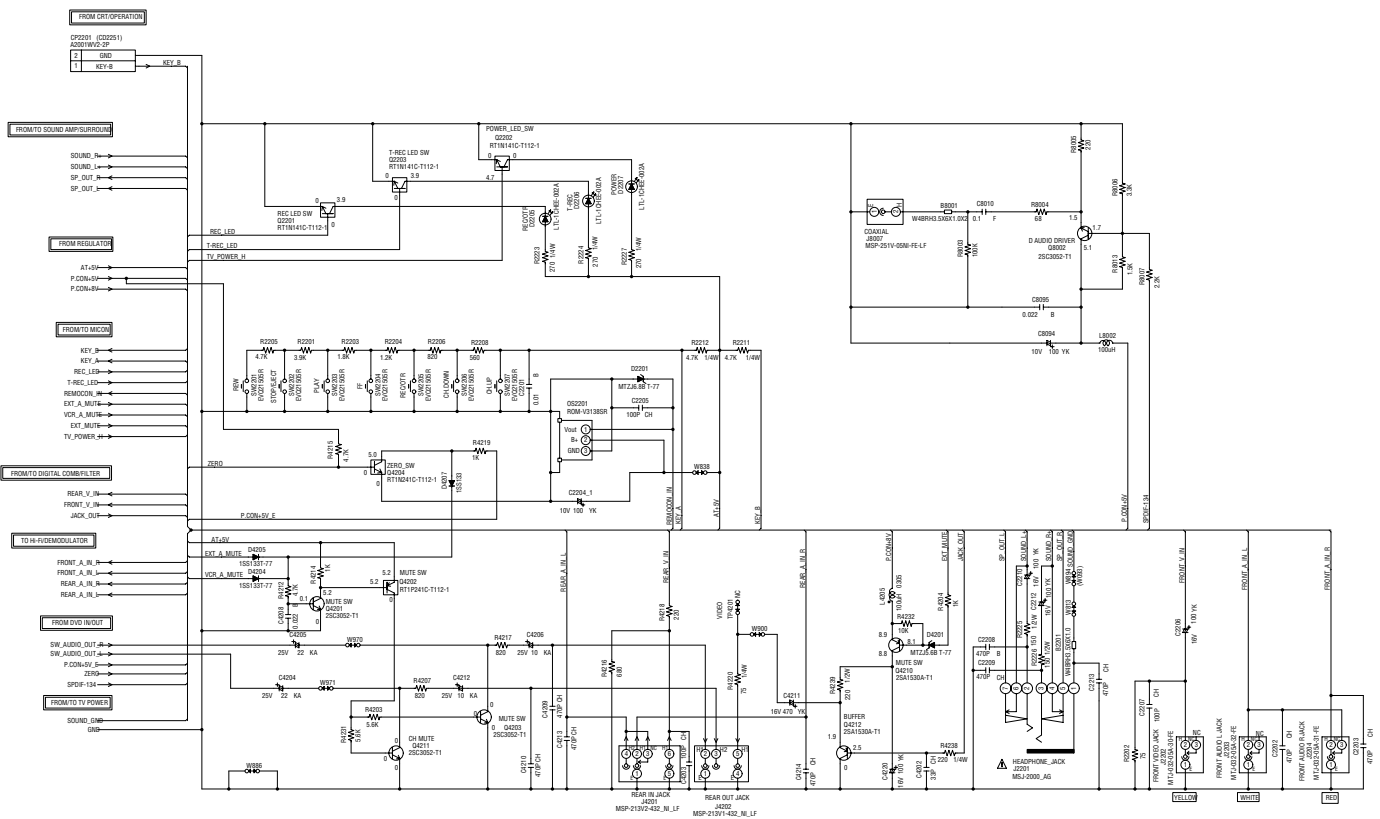
G-11

G-12

MICON SCHEMATIC DIAGRAM (VCR PCB)



IN/OUT SCHEMATIC DIAGRAM (VCR PCB)



CAUTION SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

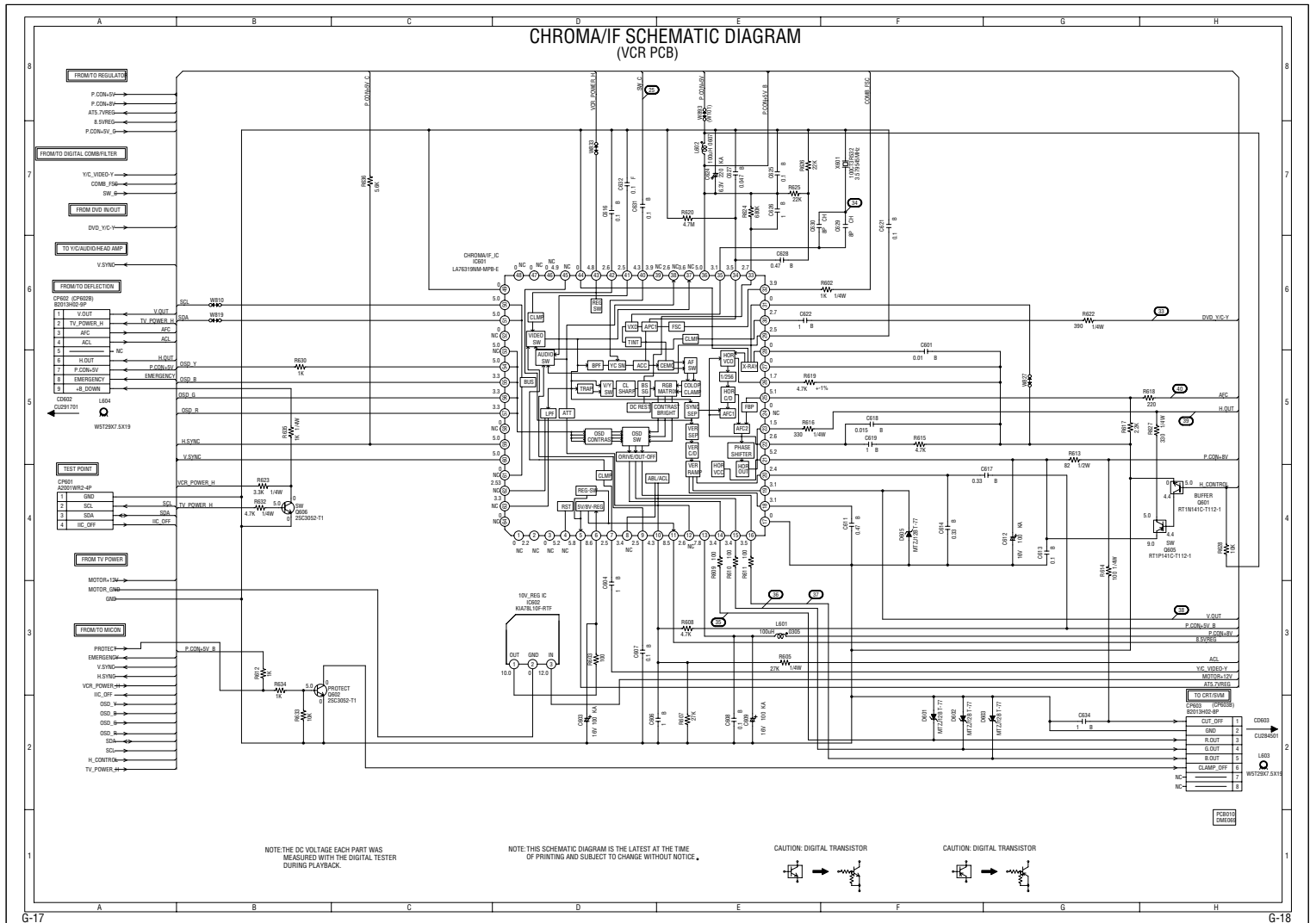
ATTENTION LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

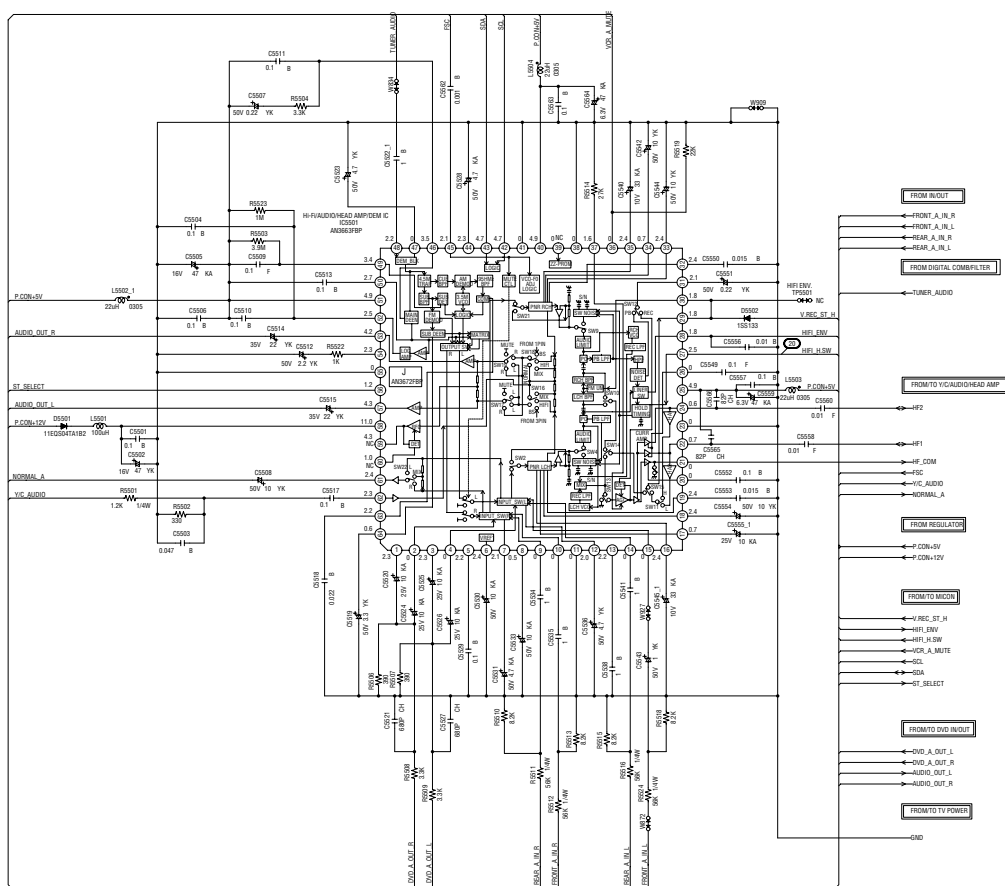
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR



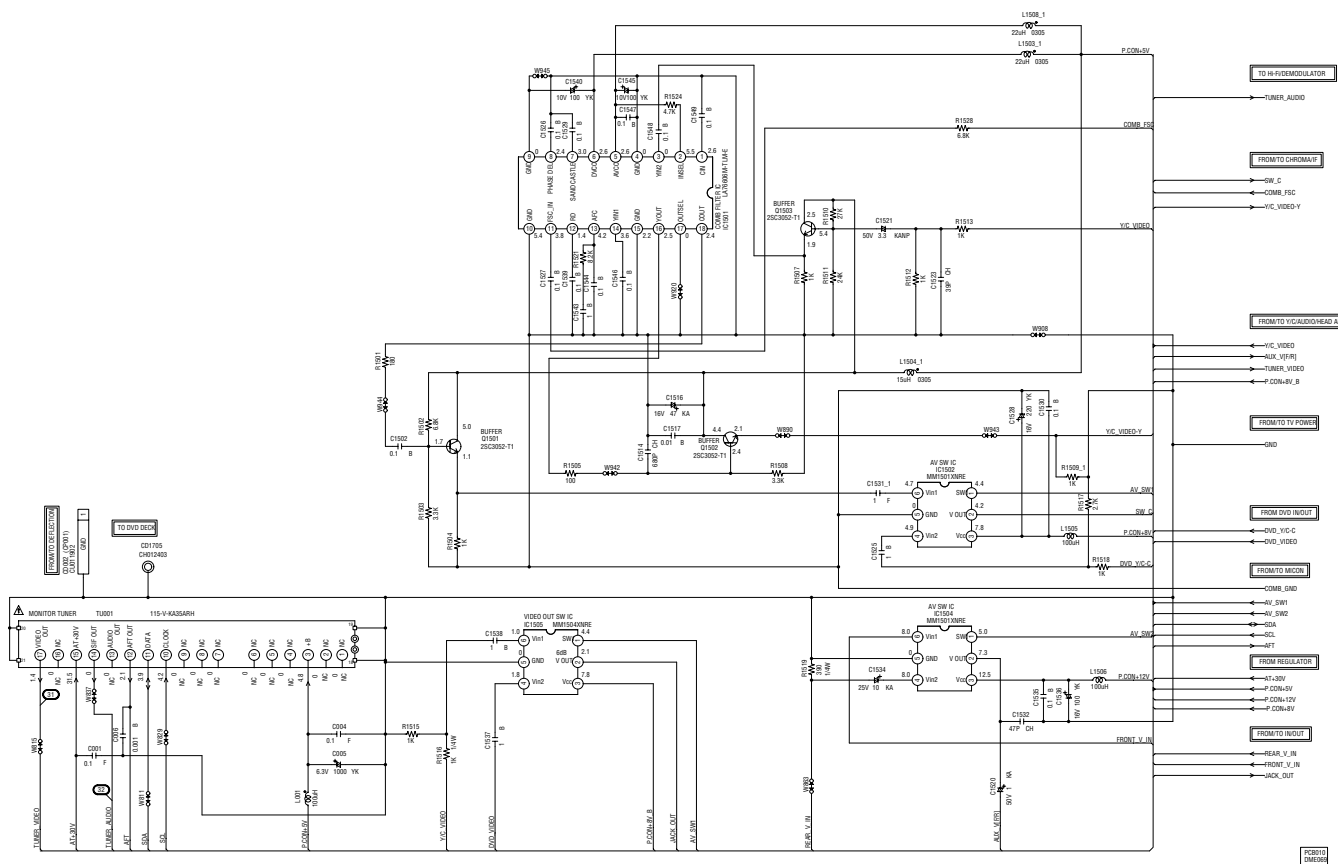
Hi-Fi/DEMODULATOR SCHEMATIC DIAGRAM (VCR PCB)



NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

DIGITAL COMB/FILTER SCHEMATIC DIAGRAM (VCR PCB)

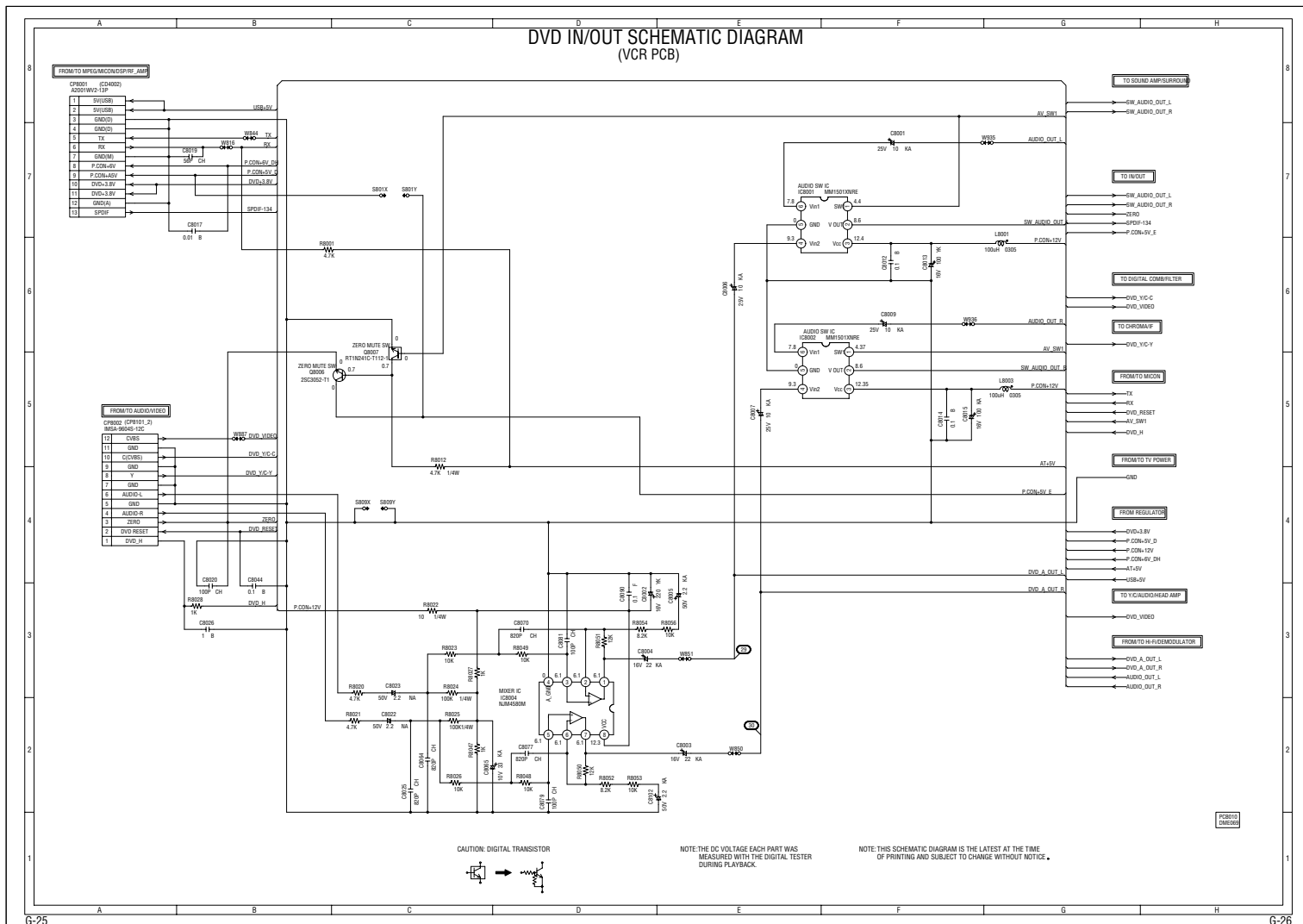


CAUTION SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

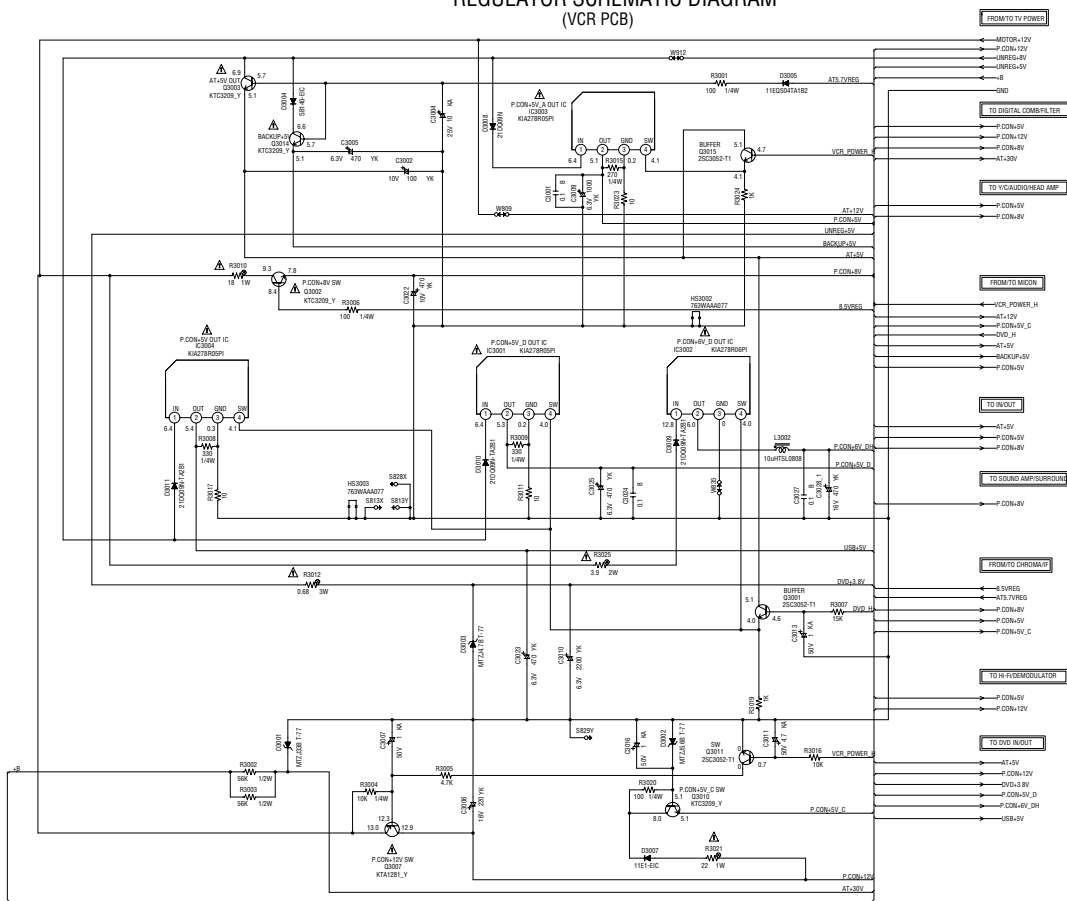
ATTENTION LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMÉNCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.



REGULATOR SCHEMATIC DIAGRAM (VCR PCB)

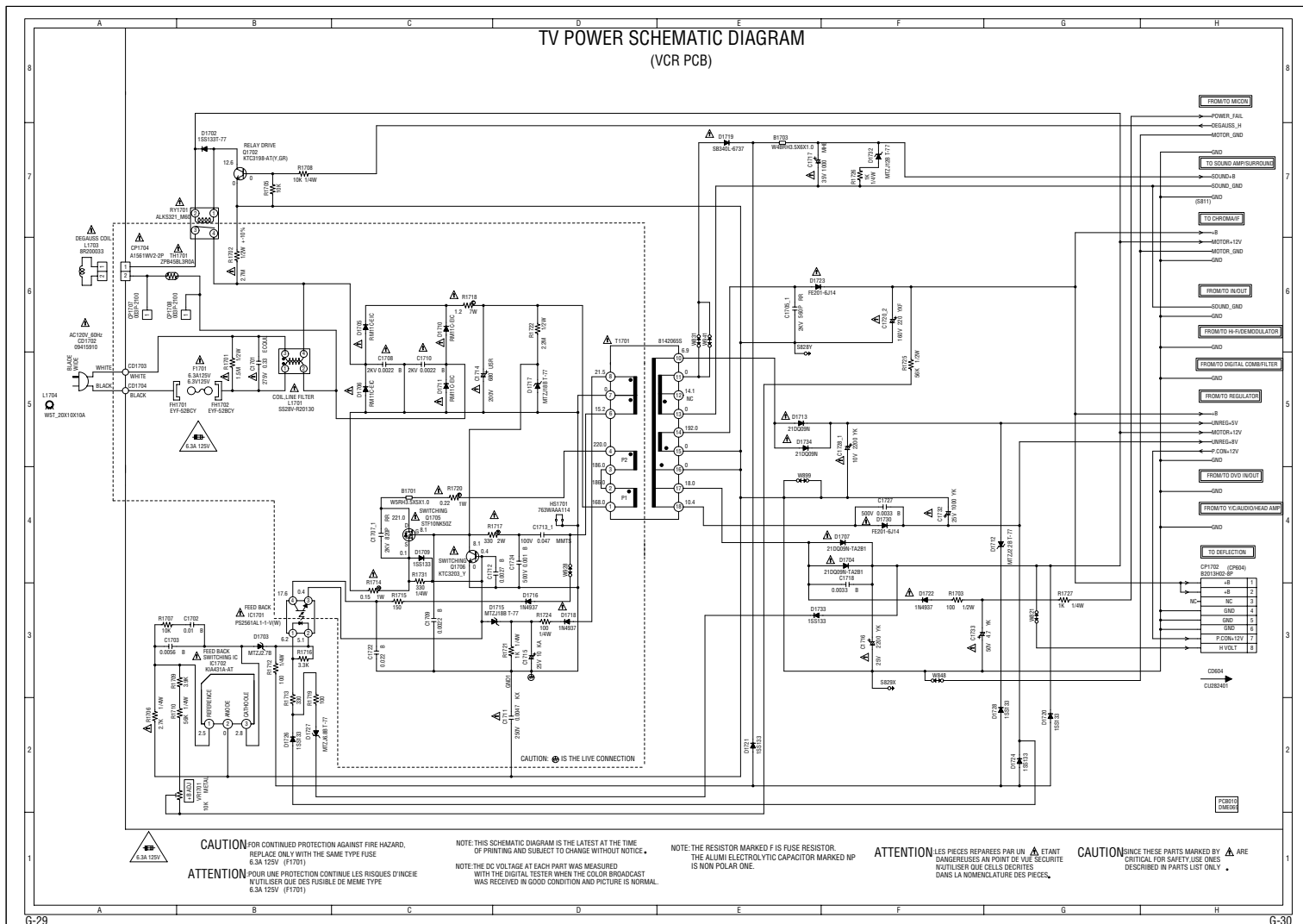


NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

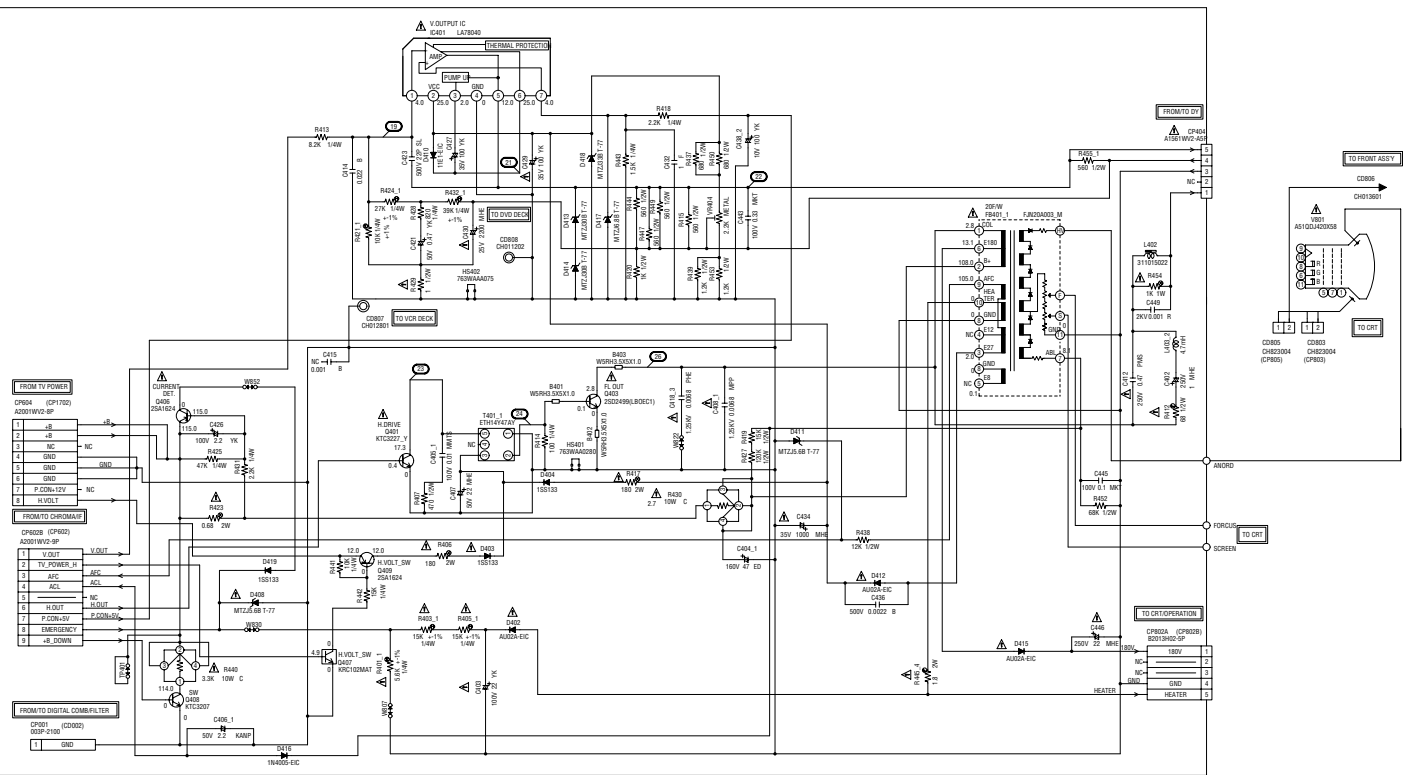
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

ATTENTION LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMÉNCLATURE DES PIÈCES.

CAUTION SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.



DEFLECTION SCHEMATIC DIAGRAM (DEFLECTION PCB)



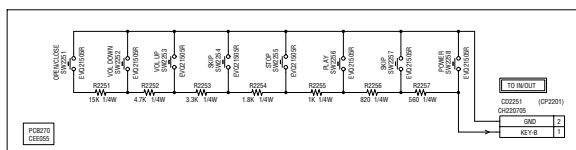
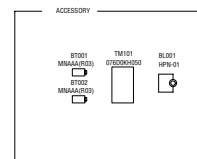
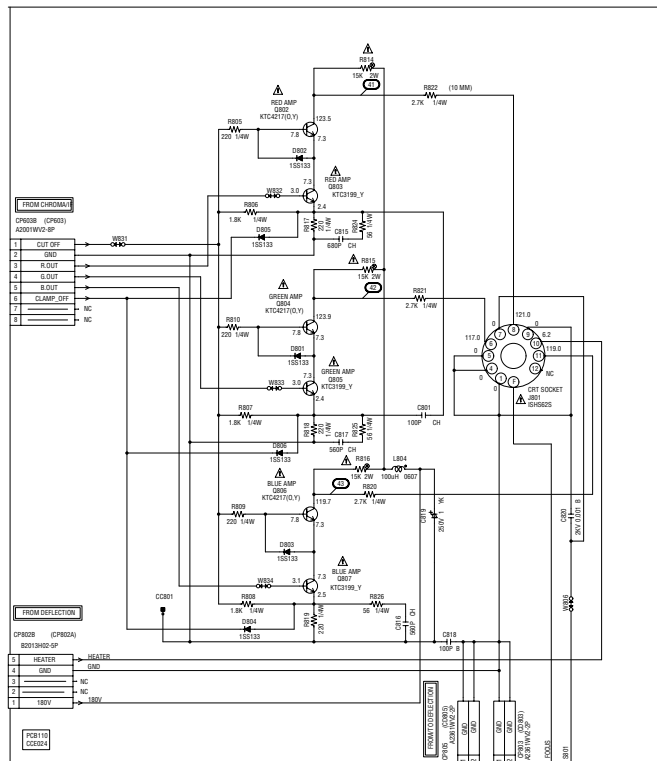
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, UTILISER QUE CELLES DÉCRITES DANS LA NOMÉCLATURE DES PIÈCES.

CAUTION: DIGITAL TRANSISTOR



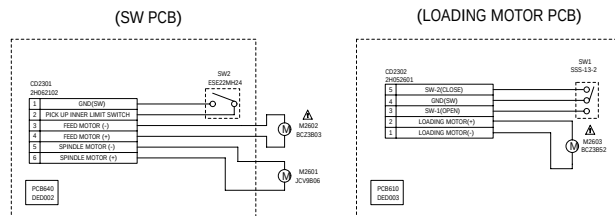
NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

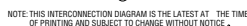
LOADING MOTOR/SW SCHEMATIC DIAGRAM



CAUTION SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION LES PIÈCES REPARÉES PAR UN  ET/ANT DANGEREUSES AU POINT DE VUE SÉCURITÉ. N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.



WAVEFORMS

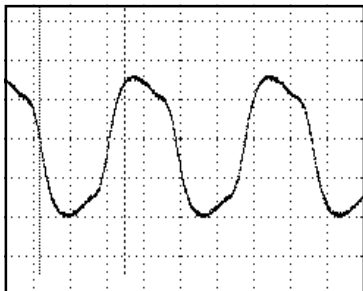
MPEG/MICON/DSP/RF_AMP

AUDIO/VIDEO

Y/C/AUDIO/HEAD AMP

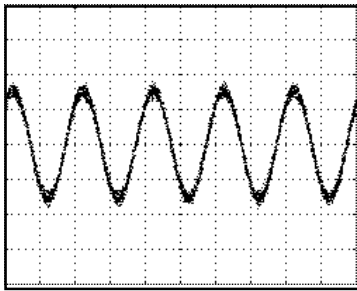
10ns
100mV

①



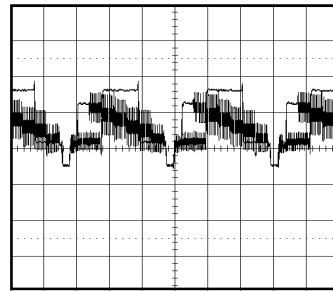
500μs
500mV

⑥



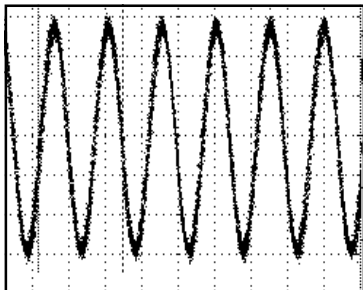
PB
20μs
1.0V

⑪



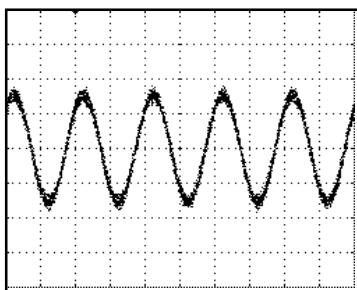
5ns
20mV

②



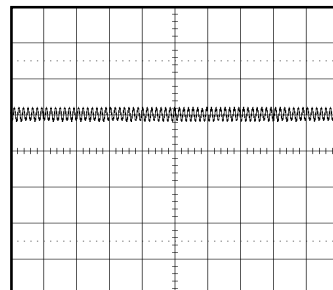
500μs
500mV

⑦



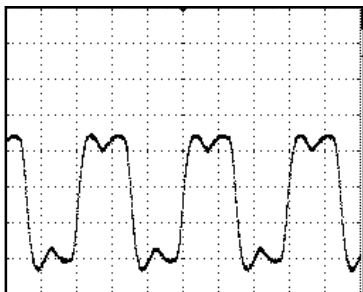
PB
20μs
1.0V

⑫



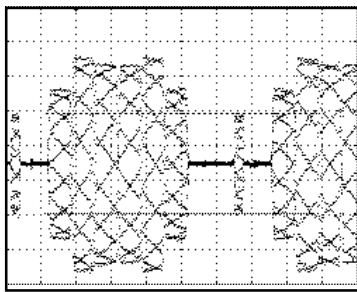
20ns
1.0V

③



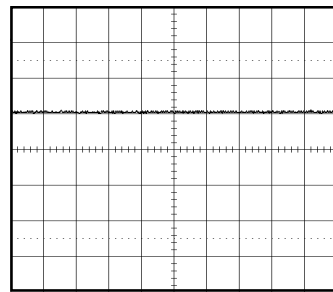
10μs
100mV

⑧



PB
1ms
1.0V

⑬



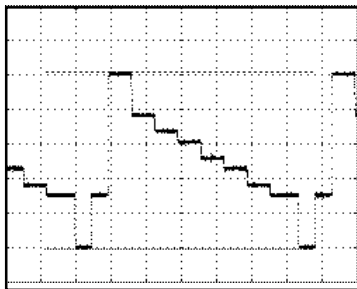
200ns
1.0V

④



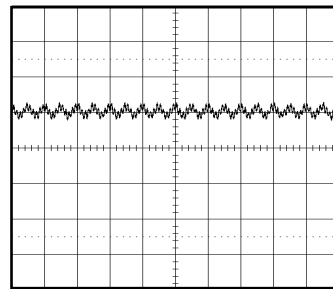
100μs
200mV

⑨



PB
5ms
2.0V

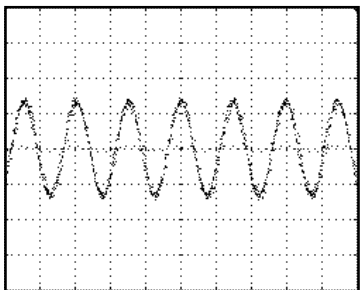
⑭



MEMORY

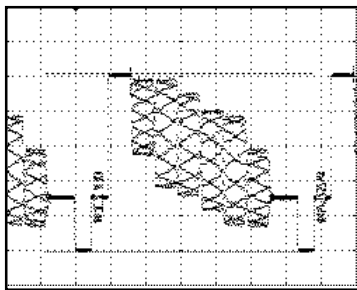
5ns
500mV

⑤



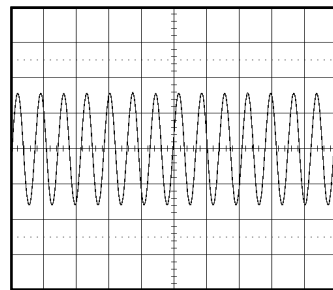
10μs
200mV

⑩



PB
20μs
20V

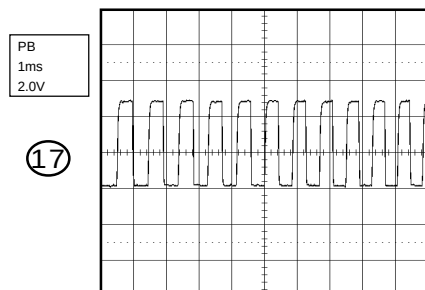
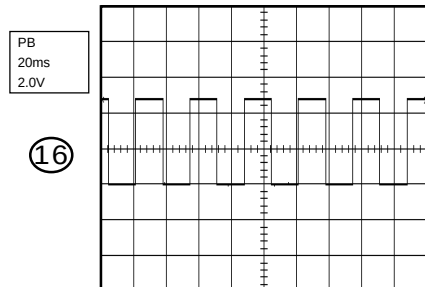
⑮



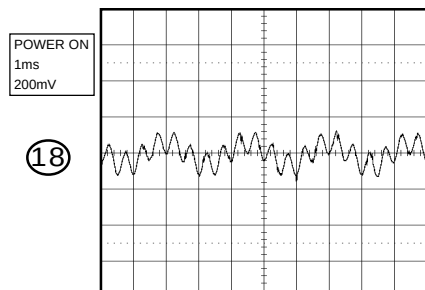
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

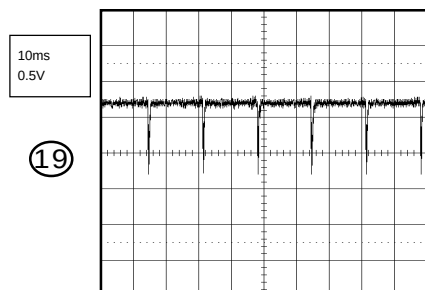
MICON



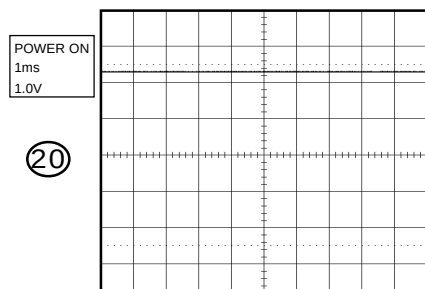
SOUND AMP/SURROUND



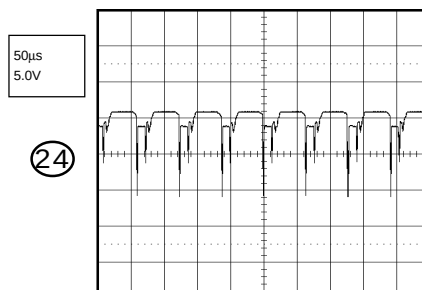
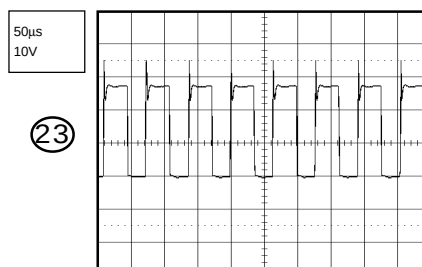
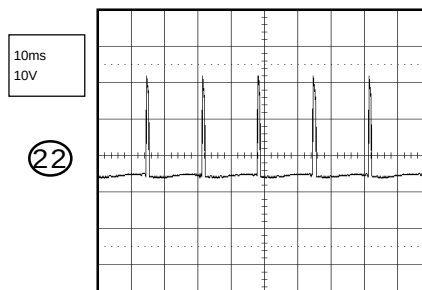
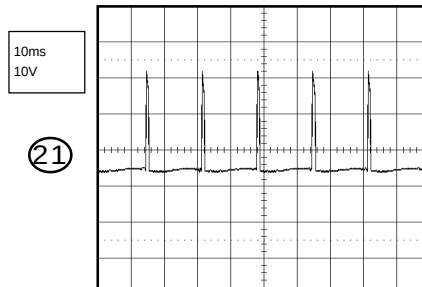
DEFLECTION



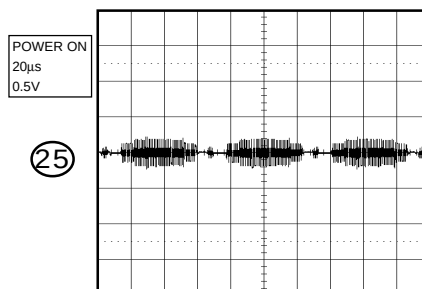
Hi-Fi/DEMODULATOR



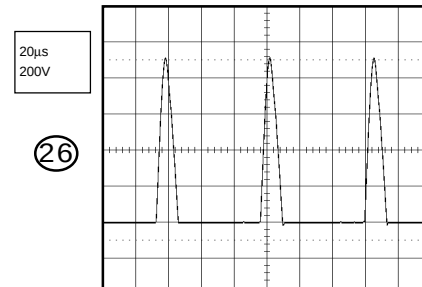
DEFLECTION



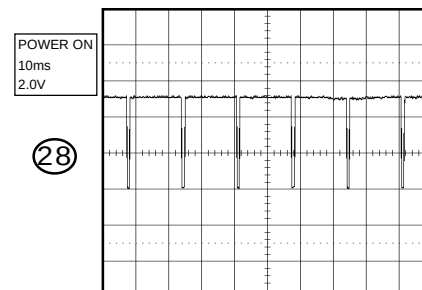
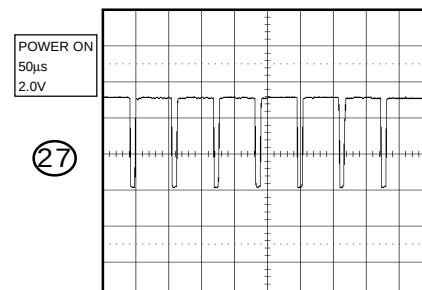
CHROMA/IF



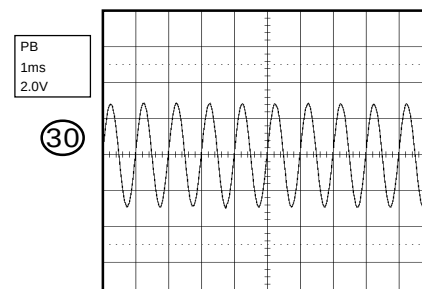
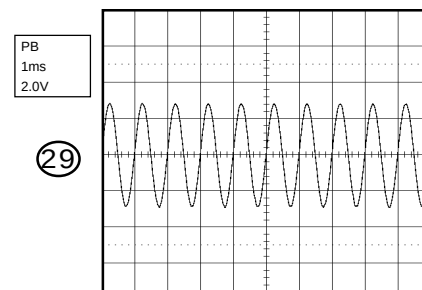
DEFLECTION



MICON



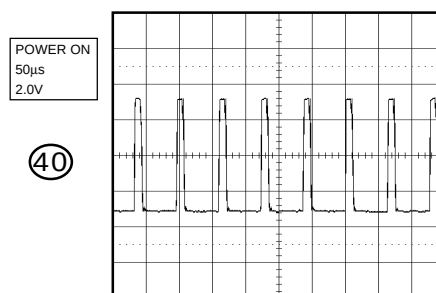
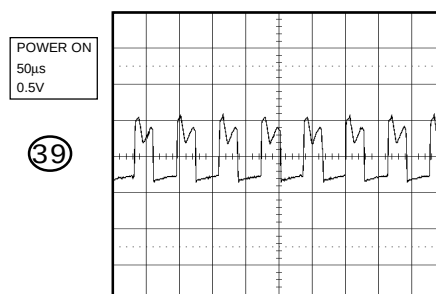
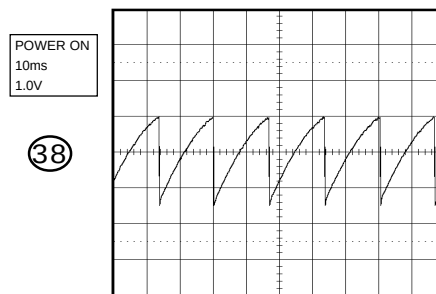
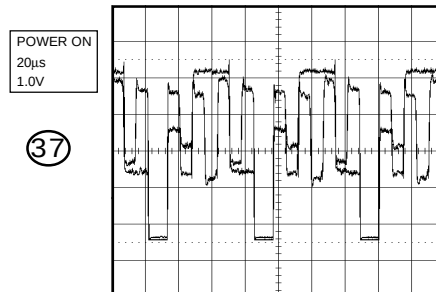
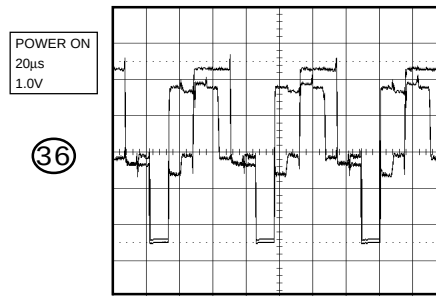
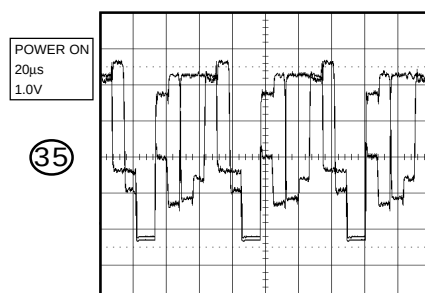
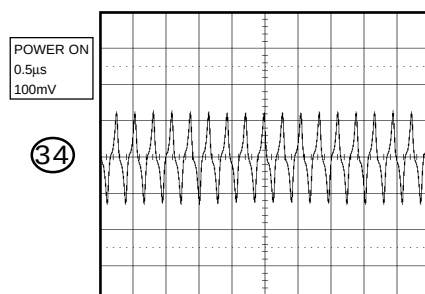
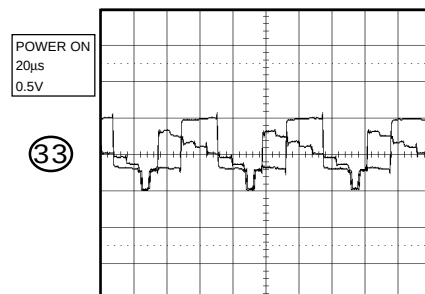
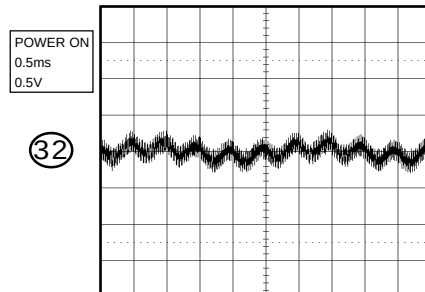
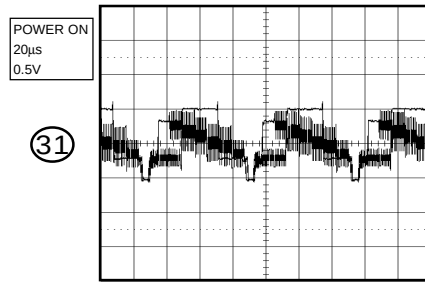
DVD IN/OUT



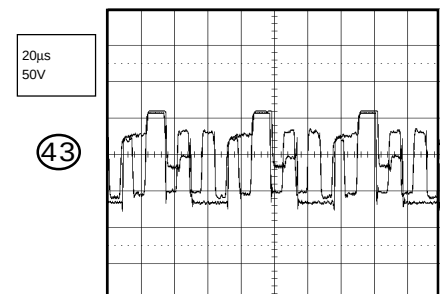
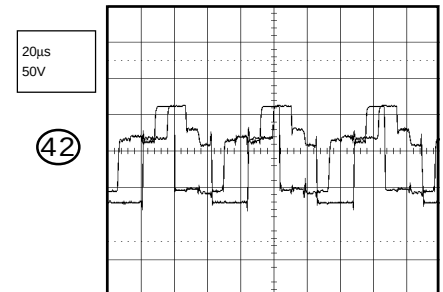
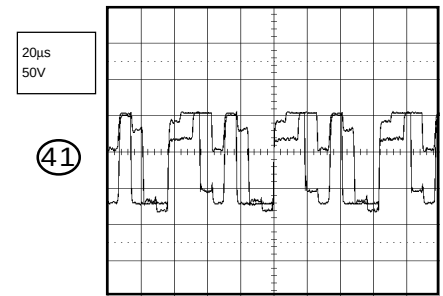
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

DIGITAL COMB/FILTER

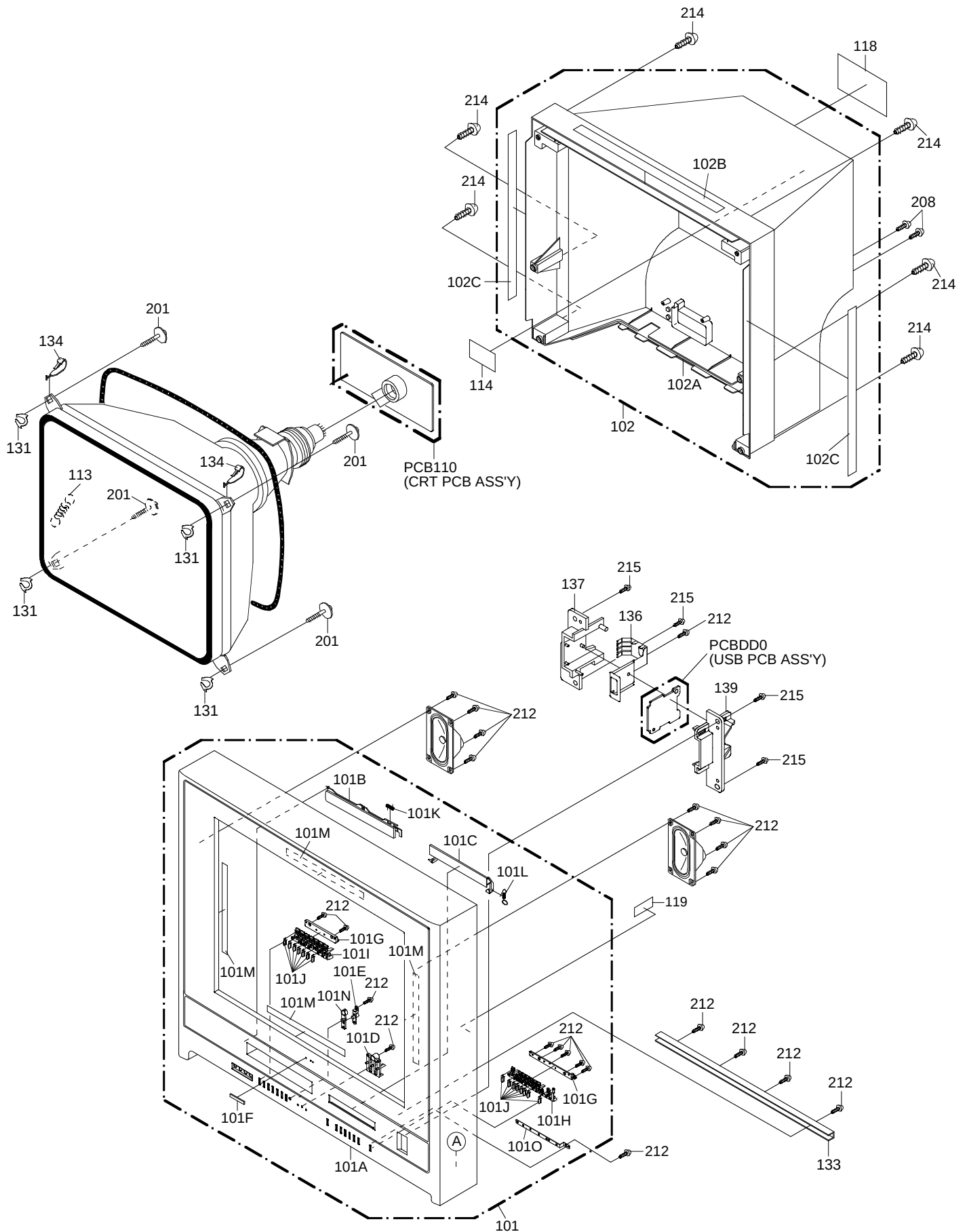


CRT/OPERATION

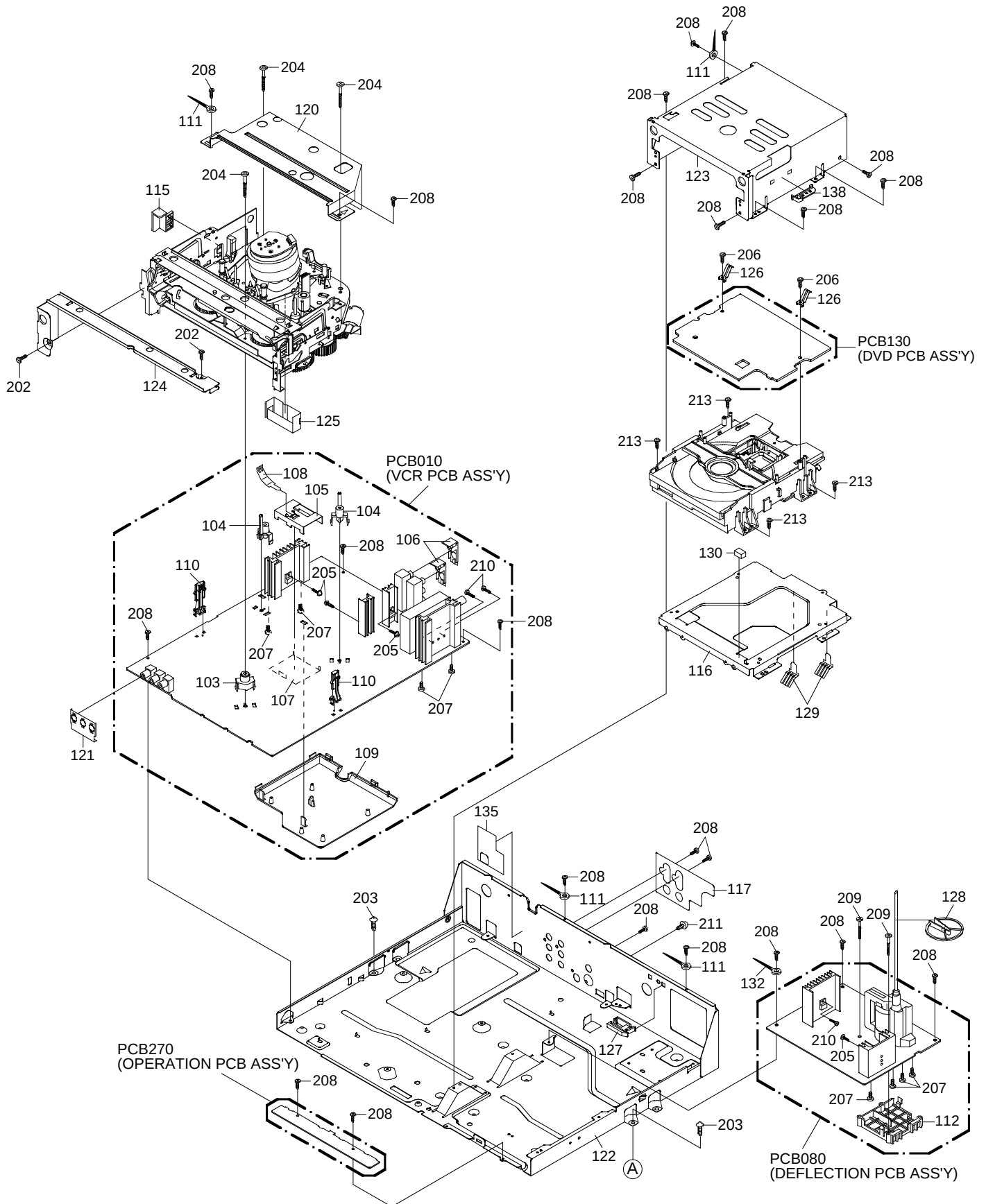


NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

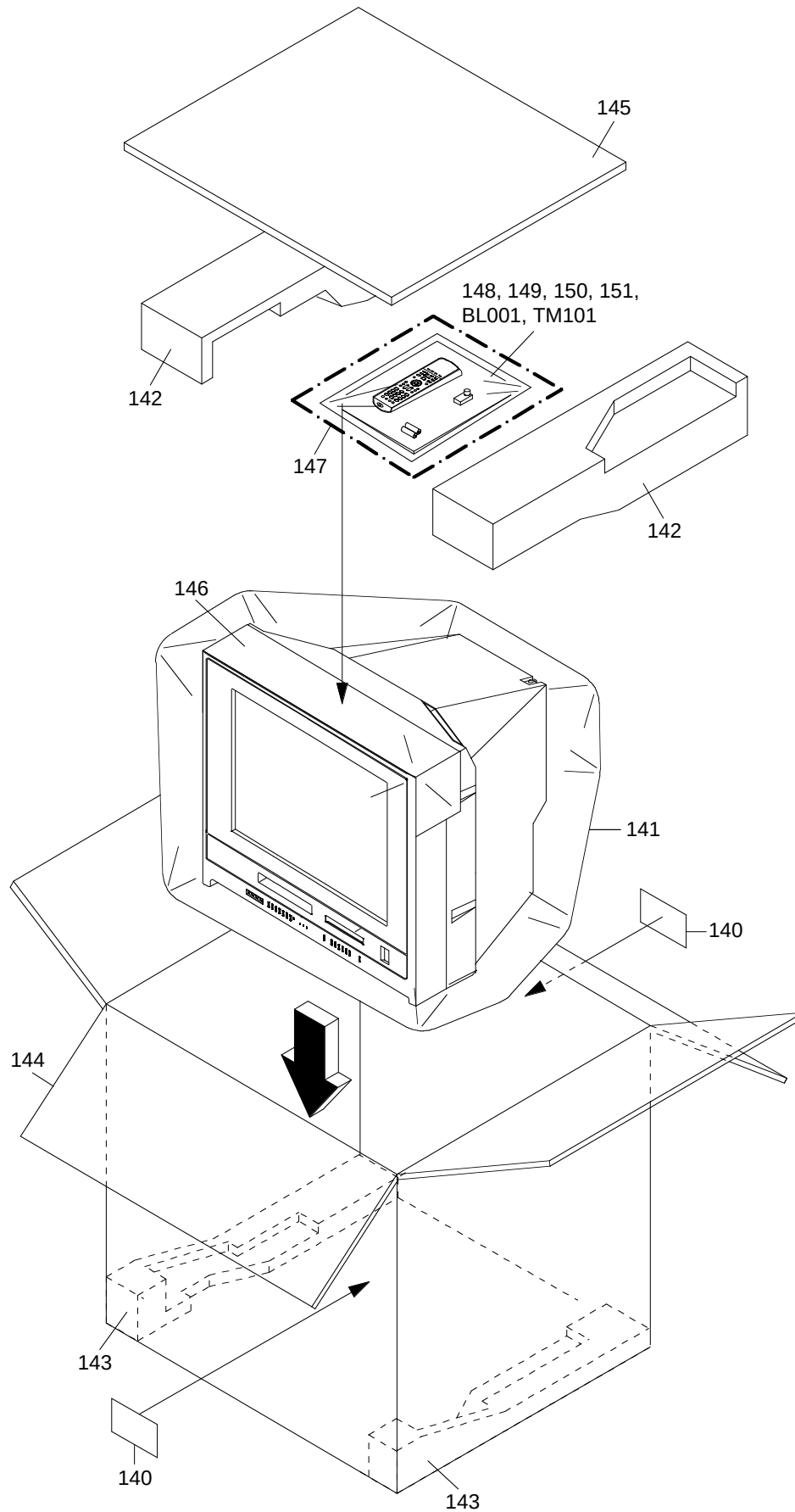
MECHANICAL EXPLODED VIEW



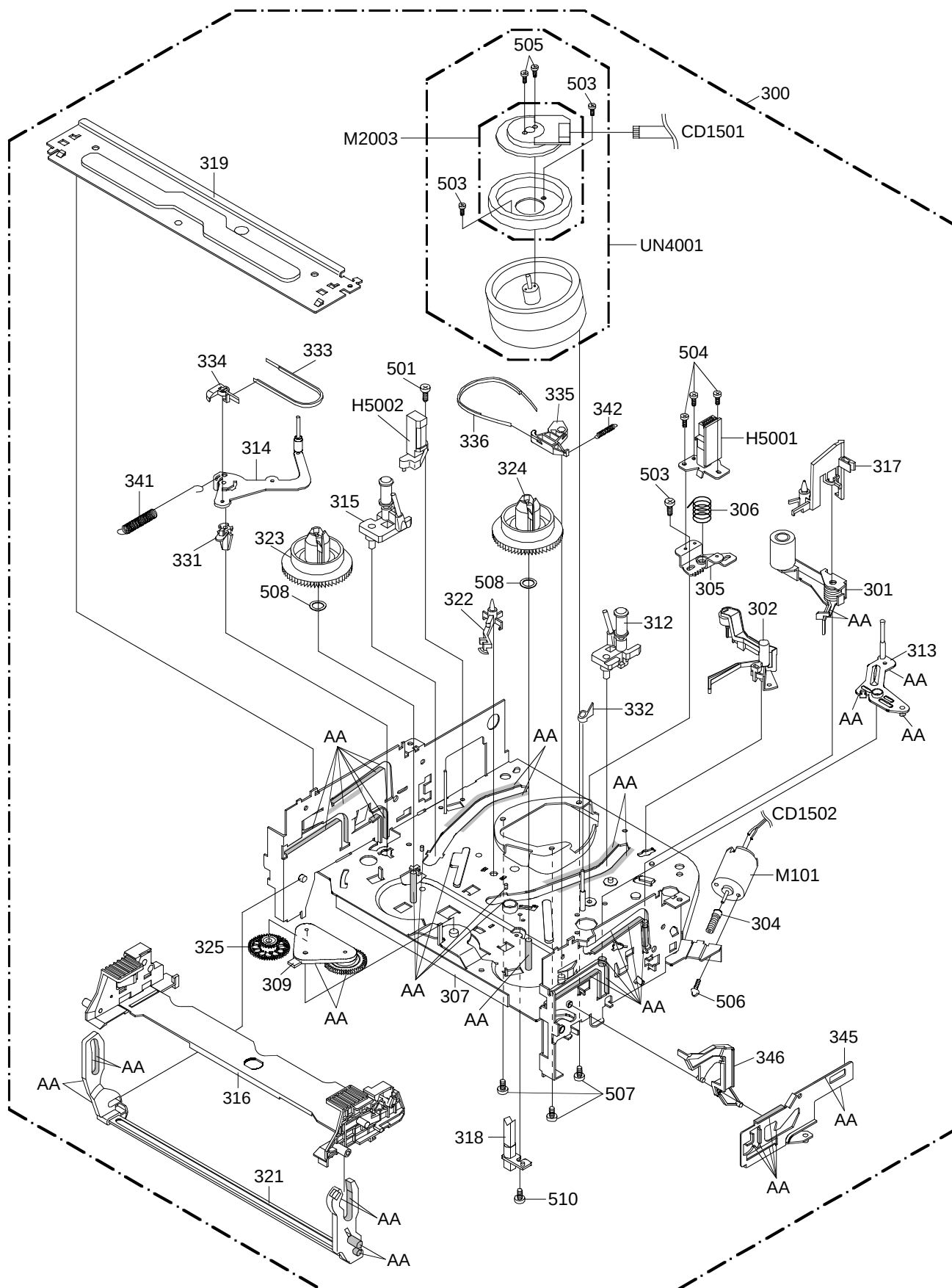
MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)



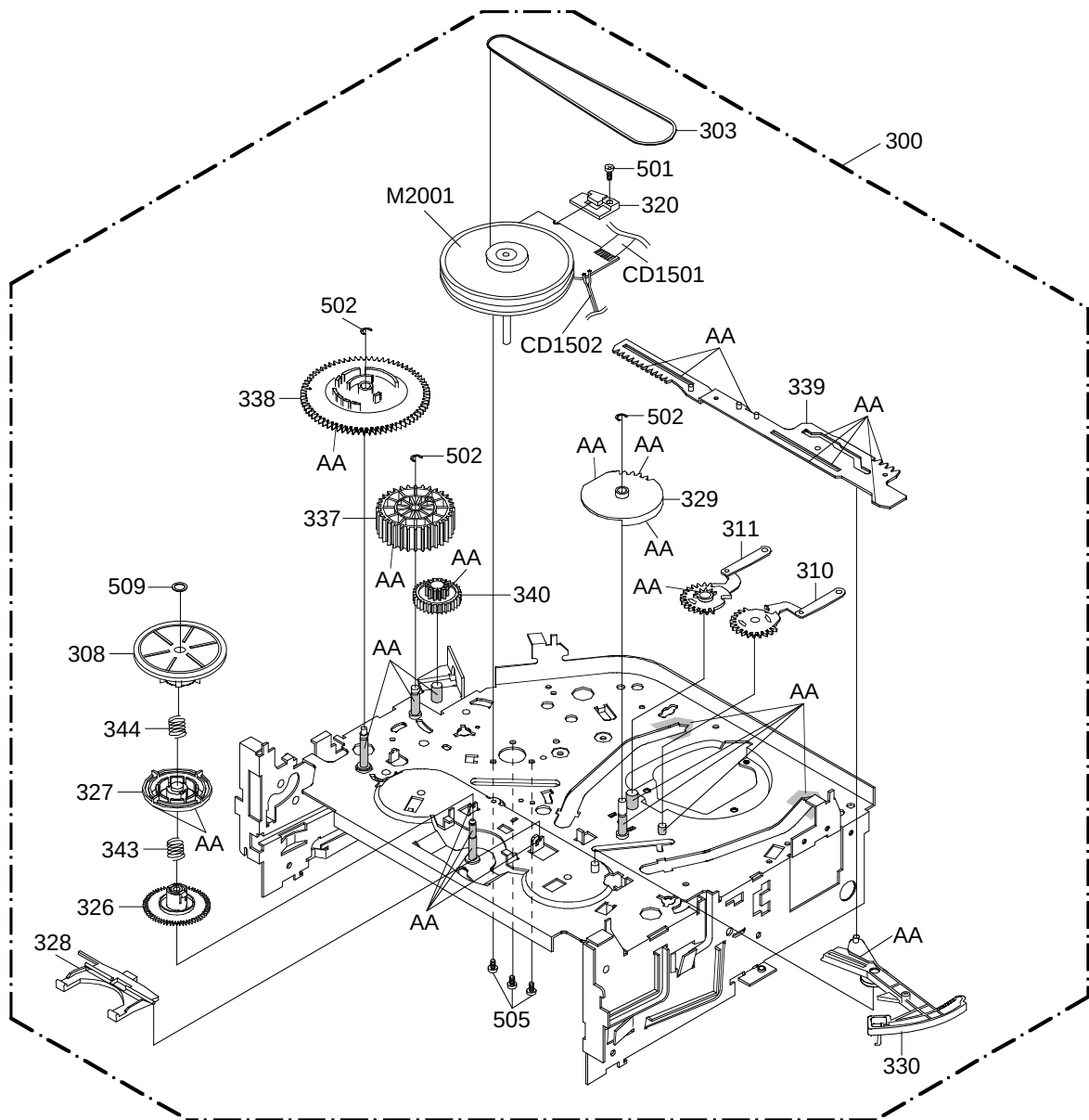
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

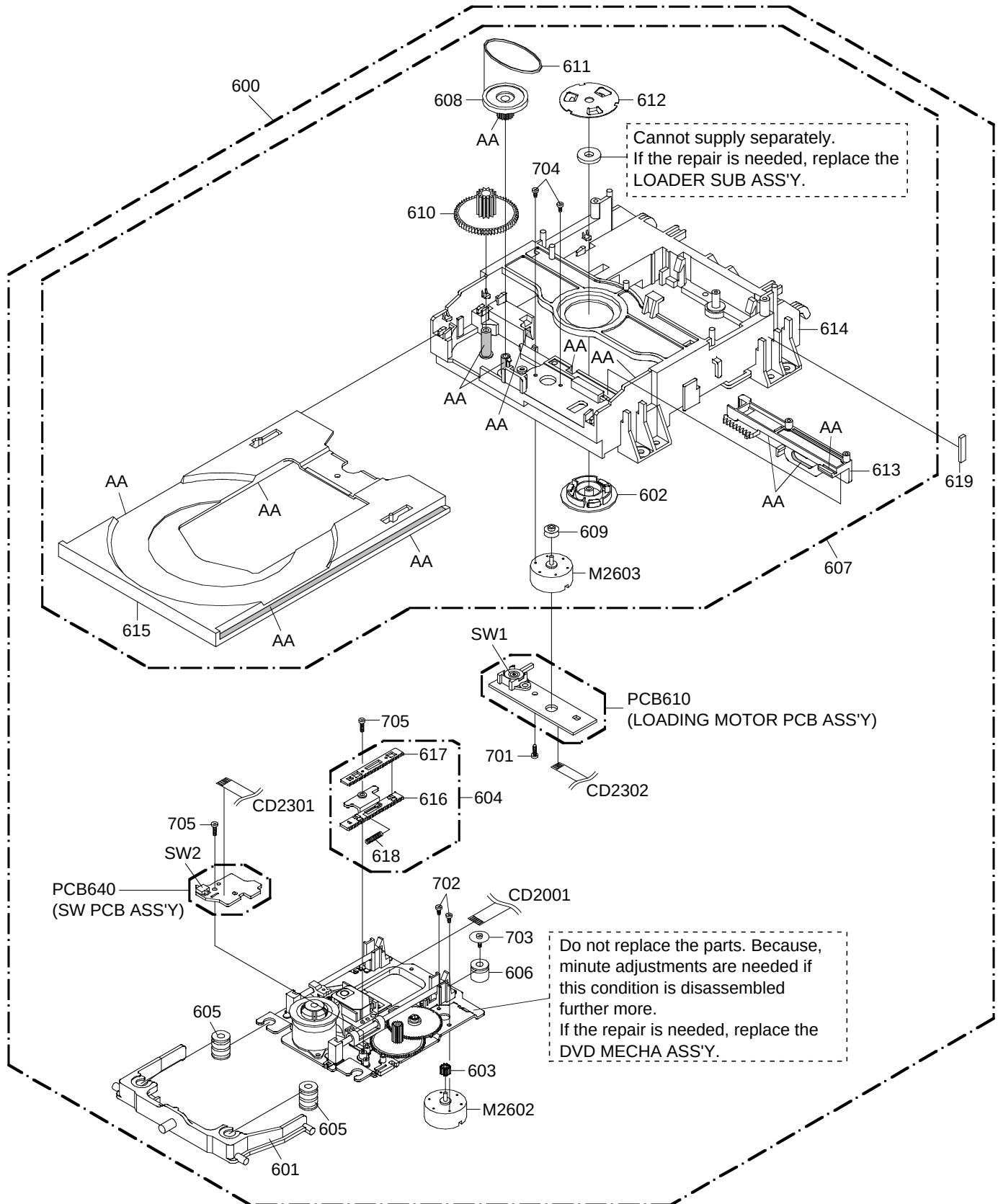
CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

DVD DECK EXPLODED VIEW



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
101	72783841	7A701A677A	FRONT CABI ASS'Y
101A	72783844	701WPJD257	CABINET FRONT
101B	72783846	712WPJC251	FLAT FLAP
101C	72783848	712WPJC252	FLAP DVD
101D	72798520	713WPA0311	GLASS,LED
101E	72798521	713WPA0312	GUIDE,REMOCON
101F	72781985	7235490036	BADGE,BRAND
101G	72798592	735WPA0805	STOPPER,BUTTON
101H	72799739	735WPAA843	BUTTON,FRAME-DVD
101I	72799740	735WPAA844	BUTTON,FRAME-VCR
101J	72799786	735WPEA002	BUTTON CAP
101K	72795666	743WKA0037	SPRING FLAP
101L	72798625	742WKA0001	SPRING DVD-FLAP
101M	72796103	800WQ0A052	FELT SHEET
101N	72798491	711WPA0200	PLATE FRONT
101O	72798653	752WSAA068	SHIELD BUTTON,DVD
102	72783451	7A702A123A	BACK CABI ASS'Y
102A	72799358	702WPAA851	CABINET,BACK
102B	72795670	800WQ0A036	FELT,SHEET
102C	72798772	800WQ0A032	FELT SHEET
103	72795673	701WPA0686	HOLDER DECK
104	72795674	701WPA0751	HOLDER DECK
105	72795675	752WSA0230	SHIELD CASE H/AMP
106	72795676	752WSA0290	SHIELD COMPO
107	72798637	752WSA0308	SHIELD,COVER H/AMP
108	72795677	753WUAA006	SPRING EARTH H/AMP
109	72783452	755WPAA033	COVER PCB
110	72795679	85OP700038	HOLDER END SENSOR
111	72795680	8995034000	CORD CLIP UL CO.
112	72795681	761WPA0223	HOLDER FBT
113	72795687	741WUA0021	SPRING EARTH
114	72784141	726000A144	SHEET CRT SERVICEMAN
115	72798660	755WPAA012	PLATE COVER LIGHT (L)
116	72795683	761WSAA023	ANGLE,DECK
117	72798555	7230007691	SHEET,JACK
118	72783870	722549A588	SHEET RATING
119	72799615	723000C727	SHEET CAUTION
120	72799882	752WSAA122	SHIELD,COVER DECK
121	72795690	752WSA0292	SHIELD AV JACK
122	72799869	752WSAA075	PLATE,BOTTOM
123	72799854	752WSA0489	DVD,TOP
124	72799870	752WSAA080	VCR,TOP
125	72798638	752WSA0327	SHIELD,COVER FPC
126	72798655	753WUAA0069	SPRING EARTH
127	72798687	774WPA0005	HOLDER WIRE-2
128	72794734	899HV3T000	HOLDER ANODE WIRE
129	72798633	744WUA0013	SPRING,EARTH
130	72781978	8965TS1017	CUSHION 65TS10-10(17.5*20*14)
131	72795682	769WSAA012	WASHER CRT T=0.5
132	72795699	899EFBA002	WIRING-CLIP
133	72795678	752WSAA083	ANGLE,FRONT
134	72798684	762WPA0011	HOLDER CRT WIRE
135	72799703	7250000596	SHEET,PC
136	72784142	752WUAA006	SHIELD USB
137	72783724	761WPA0434	HOLDER,USB-1
138	72799905	761WPA0322	HOLDER,FFC
139	72783726	761WPA0435	HOLDER,USB-2

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
140	72783880	723000D291	SHEET BAR CODE
141	72795702	791WHAA114	FILM BAG
142	72798715	792WHA0522	PACKAGE,TOP
143	72798716	792WHA0523	PACKAGE,BOTTOM
144	72783883	793WCDD111	GIFT BOX
145	72796104	795WCDA019	PAD
146	72795703	791WHAA134	LIGHTRON SHEET
147	72783885	A5W701Q975	INSTRUCTION BOOK KIT
148	72781569	J3N51617A	REGISTRATION CARD
149	72781605	J5S10229A	INFORMATION SHEET(USA)
150	72781635	JB5ND300	POLYBAG INSTRUCTION(RED CAUTION)
151	72783887	J5W70101A	INSTRUCTION BOOK
201	72781287	8141J50C5U	SCREW TAP TITE(P) GW22 5*35 CH HEXAGON
202	72781235	810723060U	SCREW TAP TITE(S) BIND 3*6 CH
203	72798794	811754080U	SCREW TAP TITE(B0) TRUSS 4*8 CH
204	72781243	8109130B9U	SCREW TAP TITE(B)R PAN 3*29 CH
205	72798789	8109I30A0U	SCREW TAP TITE(B) WH7 3*10 CH
206	72795782	811022680U	SCREW TAP TITE(P) BIND 2.6*8 CH
207	72781251	810963080Q	SCREW TAP TITE(B) BRAZIER 3*8 STAINLESS
208	72798787	810923080U	SCREW TAP TITE(B) BIND 3*8 CH
209	72781237	8107630A8U	SCREW,TAP TITE(S) BRAZIER 3*18 CH
210	72798786	810763080U	SCREW TAP TITE(S) BRAZIER 3*8 CH
211	72798785	810723040U	SCREW TAP TITE(S) BIND 3*4 CH
212	72798790	811063080U	SCREW TAP TITE(P) BRAZIER 3*8 CH
213	72781263	810F13080U	SEMS(F) 3*8 CH
214	72781279	8117540A6U	SCREW TAP TITE(B0) TRUSS 4*16 CH
215	72798791	8110630A0U	SCREW TAP TITE(P) BRAZIER 3*10 CH

CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
300	72783455	A5T410J420A	DECK ASSY A5T410J420A
301	72795710	85OA400245	PINCH ROLLER BLOCK VA2
302	72795711	85OA500026	AHC ASS'Y
303	72795712	85OP200290	BELT,CAPSTAN (S)
304	72795713	85OP600581	WORM
305	72795714	85OP500091	BASE,AC HEAD
306	72795715	85OP800324	SPRING,AC HEAD
307	72795716	85OA000528	MAIN CHASSIS ASS'Y
308	72795717	85OA200089	CLUTCH ASS'Y
309	72795718	85OA200092	ARM IDLER ASS'Y
310	72795719	85OA300068	LOADING ARM S UNIT
311	72795720	85OA300070	LOADING ARM T UNIT
312	72795721	85OA400223	INCLINED BASE T UINT 3S
313	72795722	85OA400249	P5 ARM ASS'Y 2
314	72795723	85OA400248	TENSION ARM ASS'Y 2
315	72795724	85OA400231	INCLINED BASE S UNIT
316	72795725	85OA900234	CASS HOLDER ASS'Y
317	72795726	85OP900745	CASS,OPENER
318	72795727	85OP700035	REFLECTOR,LED
319	72795728	85OP900755	BRACKET,TOP 3V
320	72795729	85OP400554	HOLDER,CAPSTAN
321	72795730	85OA900233	LINK UNIT
322	72795731	85OP000496	POST,CASS GUIDE
323	72795732	85OP200316	REEL,S (S)
324	72795733	85OP200317	REEL,T (S)
325	72795734	85OP200308	GEAR,IDLER
326	72795735	85OP200311	GEAR,CLUTCH
327	72795736	85OP200312	GEAR,COUPLING
328	72795737	85OP200313	LEVER,CLUTCH
329	72795738	85OP300194	GEAR,MAIN LOADING
330	72795739	85OP400490	LEVER,TENSION
331	72795740	85OP400492	HOLDER,TENSION
332	72795741	85OP400520	CAP.P4
333	72795742	85OP400542	BAND,TENSION
334	72795743	85OP400533	CONNECT,TENSION
335	72795744	85OP600573	ARM,BRAKE T
336	72795745	85OP600584	BAND,BRAKE T
337	72795746	85OP600577	CAM,PINCH ROLLER
338	72795747	85OP600578	CAM,MAIN
339	72795748	85OP600585	ROD,MAIN
340	72795749	85OP600582	GEAR,JOINT
341	72795750	85OP800322	SPRING,TENSION
342	72795751	85OP800360	SPRING,BRAKE T
343	72795752	85OP800355	SPRING,COUPLING
344	72795753	85OP800356	SPRING,RING
345	72795754	85OP900754	LEVER,LINK
346	72795755	85OP900744	LEVER,FLAP
501	72795756	810722680U	SCREW,TAP TITE(S) BIND M2.6*8 CH
502	72795757	83ETW3000U	E-RING 3.0
503	72795758	810722640U	SCREW,TAP TITE(S) BIND M2.6*4 CH
504	72795759	810212060U	SCREW,PAN M2*6 CH
505	72795760	810912660U	SCREW,TAP TITE(B) PAN M2.6*6 CH
506	72795761	810A13040U	SCREW/WASHER(A) M3*4 CH
507	72795762	810A12650U	SCREW/WASHER(A) M2.6*5 CH
508	72795763	82Q264713N	POLYSLIDER WASHER 2.6*4.7*T0.13
509	72795764	82P184505N	POLYSLIDER WASHER(CUT) 1.8*4.5*T0.5
510	72795765	810722660U	SCREW TAP TITE(S) BIND 2.6*6 CH
CD1501	72795865	122H071704	CORD JUMPER 2H071704
CD1502	72795866	122Y021002	CORD JUMPER 2Y021002
H5001	72795899	1523Q91003	HEAD (AUDIO CONTROL) VTR-1X2RPE22-756
H5002	72795900	1543Q02014	HEAD (FULL ERASE) VTR-1X2ERS11-154
△M101	72795944	1596S98002	MOTOR,LOADING MDB2B66B
△M2001	72795945	1510S98044	CAPSTAN DD UNIT F2QVB73B
M2003	72795946	1589S11025	MICRO MOTOR I20AL34K
△UN4001	72783456	A5T7016500	CYLINDER UNIT ASS'Y A5T7016500

DVD DECK REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
△600	72783201	A2I301H650	DVD MECHA ASS'Y A2I301H650
601	72795767	92P100109A	HOLDER, TRAVERSE
602	72795768	92P100094A	CLAMPER
603	72795769	92P100088A	GEAR, MOTOR
604	72798813	92AAA0013A	FEED RACK ASS'Y
605	72795771	92P200013A	INSULATOR(F)
606	72795772	92P200014A	INSULATOR(R)
607	72781331	92SBB0029A	LOADER SUB ASS'Y
608	72795774	92P100095A	GEAR, PULLEY
609	72795775	92P100097A	PULLEY, MOTOR
610	72795776	92P100096A	GEAR, MAIN
611	72795777	92P200012A	BELT, LOADING
612	72795778	92P000014A	PLATE, CLAMPER
613	72795779	92P100093A	RACK, LOADING
614	72795780	92P100091A	FRAME, MAIN
615	72798838	92P100092A	TRAY
616	72798836	92P100089A	RACK, FEED 1
617	72798837	92P100090A	RACK, FEED 2
618	72798849	92P300020A	SPRING, RACK FEED
619	72795888	800WFAA008	CUSHION C
701	72795782	811022680U	SCREW TAP TITE(P) BIND 2.6*8 CH
702	72795783	814011723U	SCREW, PAN M1.7*2.3 P3 CH
703	72795784	816112080U	SEMS. TAP TITE(P) PAN W10 2*8 CH
704	72795785	814011730U	SCREW, PAN M1.7*3 P3 CH
705	72796070	811022080U	SCREW, TAP TITE(P) BIND 2*8 CH
CD2001	72783183	122J4O1903	CORD JUMPER 127000-2928
CD2301	72795869	122H062102	CORD JUMPER 2H062102
CD2302	72795870	122H052601	CORD JUMPER 2H052601
△M2602	72795947	1515S98003	FEED MOTOR BCZ3B03B
△M2603	72795948	1596S18003	MOTOR, LOADING BCZ3B52B
PCB610	72783202	A5M4016610	PCB ASS'Y DED003A
PCB640	72783203	A5N813W640	PCB ASS'Y DED002B
SW1	72796050	0515S32002	SWITCH SSS-13-2
SW2	72796052	0500101037	PUSH SWITCH ESE22MH24

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△R401	72781723	R4K1T4562F	R,METAL 5.6K OHM 1/4W
△R403	72783394	R4K1T4153F	R,METAL 15K OHM 1/4W
△R405	72783394	R4K1T4153F	R,METAL 15K OHM 1/4W
△R406	72796015	R3X28A181J	R,METAL 180 OHM 2W
△R412	72798025	R65582680J	R,FUSE 68 OHM 1/2W
△R417	72796015	R3X28A181J	R,METAL 180 OHM 2W
△R423	72794624	R3X18AR68J	R,METAL OXIDE 0.68 OHM 2W
△R429	72794606	R002T2010J	RC 1 OHM 1/2W
△R430	72797991	R5X34F2R7J	R,CEMENT 2.7 OHM 10W
△R440	72797992	R5X34F332J	R,CEMENT 3.3K OHM 10W
△R445	72798036	R6558A1R8J	R,FUSE 1.8 OHM 2W
△R454	72796031	R3K181102J	R,METAL OXIDE 1K OHM 1W
R455	72797765	R00202561J	RC 560 OHM 1/2W
△R814	72796459	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△R815	72796459	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△R816	72796459	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△R1701	72795500	R002T2155J	RC 1.5M OHM 1/2W
△R1702	72794631	R0G3K2275K	RC 2.7M OHM 1/2W
△R1706	72794658	R002T4272J	RC 2.7K OHM 1/4W
△R1714	72795513	R3X181R15J	R,METAL OXIDE 0.15 OHM 1W
△R1717	72795503	R3X28A331J	R,METAL OXIDE 330 OHM 2W
△R1718	72796434	R5X2CE1R2J	R,CEMENT 1.2 OHM 7W
△R1720	72794633	R63881R22J	R,FUSE 0.22 OHM 1W
△R3010	72797841	R3X181180J	R,METAL OXIDE 18 OHM 1W
△R3012	72797936	R3X28BR68J	R,METAL OXIDE 0.68 OHM 3W
△R3021	72797845	R3X181220J	R,METAL OXIDE 22 OHM 1W
△R3025	72797905	R3X28A3R9J	R,METAL OXIDE 3.9 OHM 2W
CAPACITORS			
C321	72795574	E02LF3222M	CE 2200 UF 25V
△C403	72794396	E02LU8220M	CE 22 UF 100V
C404	72781391	E61DFB470M	CE 47 UF 160V
△C408	72797706	P4N8FJ682H	CMPP 0.0068UF 1.25KV
△C412	72795104	P4J7F3474J	CMPP 0.47 UF 250V PMS
△C418	72781648	P4G8FJ682H	CMPP 0.0068UF 1.25KV PHE
△C429	72794380	E02LU4101M	CE 100 UF 35V
△C430	72794381	E5EZF3222M	CE 2200 UF 25V
△C434	72795831	E5EZF4102M	CE 1000 UF 35V
△C446	72794394	E5EZF4102M	CE 22 UF 250V
C449	72794399	C0PLRR713K	CC 0.001 UF 2KV R
C820	72795578	C0JBB0713K	CC 0.001 UF 2KV B
△C1701	72794401	P2122B334M	CMP 0.33 UF 275V ECQUL
C1705	72797112	C0PLRR7S2K	CC 560 PF 2KV R
C1707	72795580	C0PLRR7W2K	CC 820 PF 2KV RR
△C1708	72794440	C0JBB07H3K	CC 0.0022UF 2KV B
△C1710	72794440	C0JBB07H3K	CC 0.0022UF 2KV B
△C1711	72795579	CD39E0MQ3M	CC 0.0047UF 250V
△C1714	72797461	E52DHC681M	CE 5 680 UF 200V
△C1716	72796315	E02L03222M	CE 2200 UF 25V
△C1717	72795831	E5EZF4102M	CE 1000 UF 35V
△C1720	72795571	E62NFB221M	CE 220 UF 160V
△C1728	72797363	E02L01222M	CE 2200 UF 10V
△C1732	72796331	E02L03102M	CE 1000 UF 25V
△C1733	72797413	E02LU54R7M	CE 4.7 UF 50V
DIODES			
D101	72795889	0010E00330	INFRARED LED LTE-3271T-012A-O
D102	72794491	D1VT001330	DIODE,SILICON 1SS133T-77
D103	72794489	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D104	72794478	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D105	72794491	D1VT001330	DIODE,SILICON 1SS133T-77
D106	72794487	D97U01201B	DIODE,ZENER MTZJ12B T-77
D108	72794491	D1VT001330	DIODE,SILICON 1SS133T-77
△D402	72794472	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△D403	72794491	D1VT001330	DIODE,SILICON 1SS133T-77
D404	72794491	D1VT001330	DIODE,SILICON 1SS133T-77
△D408	72794489	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D410	72794488	D2WT011E10	DIODE,SILICON 11E1-EIC
D411	72794489	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
△D412	72794472	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D413	72794471	D97U03001B	DIODE,ZENER MTZJ30B T-77
D414	72794471	D97U03001B	DIODE,ZENER MTZJ30B T-77
△D415	72794472	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D416	72795626	D2WXXN40050	DIODE,SILICON 1N4005-EIC
D417	72794478	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D418	72794465	D97U03301B	DIODE,ZENER MTZJ33B T-77
D419	72794491	D1VT001330	DIODE,SILICON 1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
DIODES			
D601	72794487	D97U01201B	DIODE,ZENER
D602	72794487	D97U01201B	DIODE,ZENER
D603	72794487	D97U01201B	DIODE,ZENER
D605	72794487	D97U01201B	DIODE,ZENER
D801	72794491	D1VT001330	DIODE,SILICON
D802	72794491	D1VT001330	DIODE,SILICON
D803	72794491	D1VT001330	DIODE,SILICON
D804	72794491	D1VT001330	DIODE,SILICON
D805	72794491	D1VT001330	DIODE,SILICON
D806	72794491	D1VT001330	DIODE,SILICON
D1702	72794491	D1VT001330	DIODE,SILICON
D1703	72797331	D97U02R71B	DIODE,ZENER
△D1704	72794480	D28T21DQN9	DIODE,SCHOTTKY
△D1705	72794473	D2WTRM11C0	DIODE,SILICON
△D1706	72794473	D2WTRM11C0	DIODE,SILICON
△D1707	72794480	D28T21DQN9	DIODE,SCHOTTKY
D1709	72794491	D1VT001330	DIODE,SILICON
△D1710	72794473	D2WTRM11C0	DIODE,SILICON
△D1711	72794473	D2WTRM11C0	DIODE,SILICON
D1712	72794468	D97U02R21B	DIODE,ZENER
△D1713	72794480	D28T21DQN9	DIODE,SCHOTTKY
D1715	72795541	D97U01801B	DIODE,ZENER
D1716	72794483	D2WXN49370	DIODE,SILICON
D1717	72795541	D97U01801B	DIODE,ZENER
△D1718	72794483	D2WXN49370	DIODE,SILICON
△D1719	72796082	D2LKB340L0	DIODE,SCHOTTKY
D1720	72794491	D1VT001330	DIODE,SILICON
D1721	72794491	D1VT001330	DIODE,SILICON
△D1722	72794483	D2WXN49370	DIODE,SILICON
△D1723	72783412	D2CF2016J0	DIODE,SILICON
D1724	72794491	D1VT001330	DIODE,SILICON
D1726	72794491	D1VT001330	DIODE,SILICON
D1727	72794478	D97U06R81B	DIODE,ZENER
D1728	72794491	D1VT001330	DIODE,SILICON
△D1730	72783412	D2CF2016J0	DIODE,SILICON
D1732	72794487	D97U01201B	DIODE,ZENER
D1733	72794491	D1VT001330	DIODE,SILICON
△D1734	72794480	D28T21DQN9	DIODE,SCHOTTKY
D2201	72794478	D97U06R81B	DIODE,ZENER
D2205	72796482	0021E2Q140	LED
D2206	72796482	0021E2Q140	LED
D2207	72796482	0021E2Q140	LED
D2303	72795897	DD7R0S3550	DIODE,SILICON
D2304	72795897	DD7R0S3550	DIODE,SILICON
D3001	72794465	D97U03301B	DIODE,ZENER
D3002	72794489	D97U05R61B	DIODE,ZENER
D3003	72797338	D97U04R71B	DIODE,ZENER
D3004	72795627	D2WXS81400	DIODE,SCHOTTKY
D3005	72795087	D28TEQS040	DIODE,SCHOTTKY
D3007	72794488	D2WT011E10	DIODE,SILICON
D3008	72794480	D28T21DQN9	DIODE,SCHOTTKY
D3009	72794480	D28T21DQN9	DIODE,SCHOTTKY
D3010	72794480	D28T21DQN9	DIODE,SCHOTTKY
D3011	72794480	D28T21DQN9	DIODE,SCHOTTKY
D4001	72795897	DD7R0S3550	DIODE,SILICON
D4002	72795897	DD7R0S3550	DIODE,SILICON
D4003	72795897	DD7R0S3550	DIODE,SILICON
D4004	72795897	DD7R0S3550	DIODE,SILICON
D4005	72795897	DD7R0S3550	DIODE,SILICON
D4201	72794489	D97U05R61B	DIODE,ZENER
D4204	72794491	D1VT001330	DIODE,SILICON
D4205	72794491	D1VT001330	DIODE,SILICON
D4207	72794491	D1VT001330	DIODE,SILICON
D5501	72795087	D28TEQS040	DIODE,SCHOTTKY
D5502	72794491	D1VT001330	DIODE,SILICON
D5901	72783766	DD7R8051L0	DIODE,SCHOTTKY
D8111	72795897	DD7R0S3550	DIODE,SILICON
D8112	72795897	DD7R0S3550	DIODE,SILICON
ICS			
IC101	72781465	I51F58078A	IC
IC103	72796084	I9UF032310	IC
IC199	72783911	A5W701Q015	INIT DATA
IC302	72794498	I01FF58910	IC
△IC352	72795908	I0FSP7522N	IC
△IC401	72795915	I03TD80400	IC
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ12B T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			MTZJ2.7B T-77
			21DQ09N-TA2B1
			RM11C-EIC
			RM11C-EIC
			21DQ09N-TA2B1
			1SS133T-77
			RM11C-EIC
			RM11C-EIC
			MTZJ2.2B T-77
			21DQ09N-TA2B1
			MTZJ18B T-77
			1N4937
			MTZJ18B T-77
			1N4937
			SB340L-6737
			1SS133T-77
			1SS133T-77
			1N4937
			FE201-6J14
			1SS133T-77
			1SS133T-77
			MTZJ6.8B T-77
			1SS133T-77
			FE201-6J14
			MTZJ12B T-77
			1SS133T-77
			21DQ09N-TA2B1
			MTZJ6.8B T-77
			LTL-1CHEE-002A
			LTL-1CHEE-002A
			LTL-1CHEE-002A
			1SS355 TE-17
			1SS355 TE-17
			MTZJ33B T-77
			MTZJ5.6B T-77
			MTZJ4.7B T-77
			SB140-EIC
			11EQS04TA1B2
			11E1-EIC
			21DQ09N-TA2B1
			21DQ09N-TA2B1
			21DQ09N-TA2B1
			21DQ09N-TA2B1
			1SS355 TE-17
			1SS355 TE-17
			1SS355 TE-17
			1SS355 TE-17
			1SS355 TE-17
			MTZJ5.6B T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			11EQS04TA1B2
			1SS133T-77
			RB051L-40, TE25
			1SS355 TE-17
			1SS355 TE-17
			OEC8078A
			PST3231NR
			AT24C04N-10SU-2.7
			AN5891SA-E1V
			AN7522N
			LA78040

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
ICS			
IC601	72797541	I03FC319N0	LA76319NM-MPB-E
IC602	72797598	I1KF98L100	KIA78L10F-RTF
IC1501	72783240	I03FE66060	LA76606M-TLM-E
IC1502	72794502	I0UF015010	MM1501XNRE
IC1504	72794502	I0UF015010	MM1501XNRE
IC1505	72797575	I0UF015040	MM1504XNRE
△IC1701	72794512	000220002W	PS2561AL1-1-V(W)
△IC1702	72794508	I1KJ9A431A	KIA431A-AT
IC2301	72783216	I03FV65650	LA6565VR-TLM-E
△IC3001	72795906	I1KA78R050	KIA278R05PI
△IC3002	72797593	I1KA98R060	KIA278R06PI
△IC3003	72795906	I1KA78R050	KIA278R05PI
IC3004	72795906	I1KA78R050	KIA278R05PI
IC4001	72783785	ICQK068860	ZR36886HLCG
IC4003	72781440	I07F0C0WF0	BA00BC0WFP-E2
IC4004	72781440	I07F0C0WF0	BA00BC0WFP-E2
IC4005	72783786	IF9J0164AG	M12L64164A-7TG
IC4007	72784157	S5W701QF01	SST39VF1601-70-4C-EKE
IC4501	72797537	I03F3205M0	LA71205M-MPB
IC5501	72797530	I01F63FBP0	AN3663FBP
IC5901	72783789	I4UF097020	RT9702-PB
IC8001	72794502	I0UF015010	MM1501XNRE
IC8002	72794502	I0UF015010	MM1501XNRE
IC8004	72795921	I0QJ045800	NJM4580M(TE1)
IC8102	72795922	I17F017530	PCM1753DBQR
TRANSISTORS			
Q101	72795960	0000M00390	PHOTO TRANSISTOR
Q102	72796429	TNRAC05003	COMPOUND TRANSISTOR
Q103	72795960	0000M00390	PHOTO TRANSISTOR
Q104	72796090	0002700680	PHOTO COUPLER
Q105	72796090	0002700680	PHOTO COUPLER
Q106	72796429	TNRAC05003	COMPOUND TRANSISTOR
Q107	72796091	0002700690	PHOTO COUPLER
Q108	72796091	0002700690	PHOTO COUPLER
Q110	72796427	TNRAB05004	COMPOUND TRANSISTOR
Q112	72795479	T8RA030520	TRANSISTOR,SILICON
Q114	72795481	T6RA015300	TRANSISTOR,SILICON
Q116	72795479	T8RA030520	TRANSISTOR,SILICON
Q350	72795479	T8RA030520	TRANSISTOR,SILICON
△Q401	72794561	TCAT03227Y	TRANSISTOR,SILICON
△Q403	72795477	TDUU024990	TRANSISTOR,SILICON
△Q406	72794569	TA3T016240	TRANSISTOR,SILICON
Q407	72798355	TNATB03005	COMPOUND TRANSISTOR
Q408	72794565	TCAT032070	TRANSISTOR,SILICON
Q409	72794569	TA3T016240	TRANSISTOR,SILICON
Q601	72796427	TNRAB05004	COMPOUND TRANSISTOR
Q602	72795479	T8RA030520	TRANSISTOR,SILICON
Q605	72796425	TPRAB05002	COMPOUND TRANSISTOR
Q606	72795479	T8RA030520	TRANSISTOR,SILICON
△Q802	72794574	TCA0042170	TRANSISTOR,SILICON
△Q803	72794573	TCATC3199Y	TRANSISTOR,SILICON
△Q804	72794574	TCA0042170	TRANSISTOR,SILICON
△Q805	72794573	TCATC3199Y	TRANSISTOR,SILICON
△Q806	72794574	TCA0042170	TRANSISTOR,SILICON
△Q807	72794573	TCATC3199Y	TRANSISTOR,SILICON
Q1501	72795479	T8RA030520	TRANSISTOR,SILICON
Q1502	72795479	T8RA030520	TRANSISTOR,SILICON
Q1503	72795479	T8RA030520	TRANSISTOR,SILICON
Q1702	72794577	TCATC31980	TRANSISTOR,SILICON
△Q1705	72783392	TJXG10NK50	FET
△Q1706	72795476	TCAT032034	TRANSISTOR,SILICON
Q2201	72796427	TNRAB05004	COMPOUND TRANSISTOR
Q2202	72796427	TNRAB05004	COMPOUND TRANSISTOR
Q2203	72796427	TNRAB05004	COMPOUND TRANSISTOR
Q2301	72783823	TAAA1505SY	TRANSISTOR,SILICON
Q2302	72783824	TAAA1544T0	TRANSISTOR,SILICON
Q2303	72795479	T8RA030520	TRANSISTOR,SILICON
Q2304	72795479	T8RA030520	TRANSISTOR,SILICON
Q2305	72795479	T8RA030520	TRANSISTOR,SILICON
Q3001	72795479	T8RA030520	TRANSISTOR,SILICON
△Q3002	72794570	TCAT03209Y	TRANSISTOR,SILICON
△Q3003	72794570	TCAT03209Y	TRANSISTOR,SILICON
△Q3007	72796092	TAAT01281Y	TRANSISTOR,SILICON
Q3010	72794570	TCAT03209Y	TRANSISTOR,SILICON
Q3011	72795479	T8RA030520	TRANSISTOR,SILICON
			ST-304L
			RT1N241C-T112-1
			ST-304L
			RPI-352C40N
			RPI-352C40N
			RT1N241C-T112-1
			RPI-303
			RPI-303
			RT1N141C-T112-1
			2SC3052-T1
			2SA1530A-T1
			2SC3052-T1
			2SC3052-T1
			KTC3227_Y-AT
			2SD2499(LBOEC1)
			2SA1624-AA
			KRC102MAT
			KTC3207-AT
			2SA1624-AA
			RT1N141C-T112-1
			2SC3052-T1
			RT1P141C-T112-1
			2SC3052-T1
			KTC4217(O,Y)
			KTC3199_Y-AT
			KTC4217(O,Y)
			KTC3199_Y-AT
			KTC4217(O,Y)
			KTC3199_Y-AT
			2SC3052-T1
			2SC3052-T1
			2SC3052-T1
			KTC3198-AT(Y,GR)
			STF10NK50Z
			KTC3203_Y-AT
			RT1N141C-T112-1
			RT1N141C-T112-1
			RT1N141C-T112-1
			KTA1505S-Y-RTK/P
			KTA1544T-RTK/P
			2SC3052-T1
			2SC3052-T1
			2SC3052-T1
			2SC3052-T1
			KTC3209_Y-AT
			KTC3209_Y-AT
			KTA1281_Y
			KTC3209_Y-AT
			2SC3052-T1

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
TRANSISTORS				
△Q3014	72794570	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q3015	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4004	72794571	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q4201	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4202	72796428	TPRAC05003	COMPOUND TRANSISTOR	RT1P241C-T112-1
Q4203	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4204	72796429	TNRAC05003	COMPOUND TRANSISTOR	RT1N241C-T112-1
Q4210	72795481	T6RA015300	TRANSISTOR,SILICON	2SA1530A-T1
Q4211	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4212	72795481	T6RA015300	TRANSISTOR,SILICON	2SA1530A-T1
Q4501	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4502	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4503	72796428	TPRAC05003	COMPOUND TRANSISTOR	RT1P241C-T112-1
Q4504	72795476	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q4505	72794578	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q4506	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4507	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q4509	72795481	T6RA015300	TRANSISTOR,SILICON	2SA1530A-T1
Q4511	72795481	T6RA015300	TRANSISTOR,SILICON	2SA1530A-T1
Q8002	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q8006	72795479	T8RA030520	TRANSISTOR,SILICON	2SC3052-T1
Q8007	72796429	TNRAC05003	COMPOUND TRANSISTOR	RT1N241C-T112-1
Q8104	72794566	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
COILS & TRANSFORMERS				
L001	72796492	021673101J	COIL	100 UH
L301	72796407	02167D101K	COIL	100 UH
L402	72783928	022K00053A	COIL,LINEARITY	311015022
L403	72795560	021L75472J	COIL	4.7 MH
L601	72794540	02167F101J	COIL	100 UH
L602	72796407	02167D101K	COIL	100 UH
L603	72796088	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L604	72796088	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L804	72796407	02167D101K	COIL	100 UH
L1503	72794526	02167F220J	COIL	22 UH
L1504	72795932	02167F150J	COIL	15 UH
L1505	72794537	021LA6101K	COIL	100 UH
L1506	72794537	021LA6101K	COIL	100 UH
L1508	72794526	02167F220J	COIL	22 UH
△L1701	72795934	029X000116	COIL,LINE FILTER	SS28V-R20130
△L1703	72783924	028R200033	COIL,DEGAUSS	8R200033
L1704	72796645	02AHB0A0A4	CORE,FERRITE	W5T_20X10X10A
L3002	72796087	02167E100K	COIL	R6-1 10 UH
L4001	72795936	02167F2R2J	COIL	2.2 UH
L4002	72796088	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L4205	72794540	02167F101J	COIL	100 UH
L4502	72796100	031626009R	COIL,BIAS OSC	1626009
L4504	72794540	02167F101J	COIL	100 UH
L4505	72796089	02167F470J	COIL	47 UH
L4506	72796089	02167F470J	COIL	47 UH
L4509	72796407	02167D101K	COIL	100 UH
L5501	72794537	021LA6101K	COIL	100 UH
L5502	72794526	02167F220J	COIL	22 UH
L5503	72794526	02167F220J	COIL	22 UH
L5504	72794526	02167F220J	COIL	22 UH
L5903	72796644	02A6B2E0A1	CORE,FERRITE	HF70T22*10*14
L8001	72794540	02167F101J	COIL	100 UH
L8002	72794537	021LA6101K	COIL	100 UH
L8003	72794540	02167F101J	COIL	100 UH
L8102	72795943	02167F1R0K	COIL	1 UH
L8103	72795943	02167F1R0K	COIL	1 UH
L8104	72795943	02167F1R0K	COIL	1 UH
T401	72796055	045013003J	TRANS,HORIZONTAL DRIVE	ETH14Y47AY
△T1701	72796707	048142065S	TRANSFORMER,SWITCHING	8142065S
JACKS				
△J801	72794523	066F130021	SOCKET,CATHODE RAY,TUBE	ISHS62S
△J2201	72794516	060J131016	HEADPHONE JACK	MSJ-2000_AG
J2202	72795924	060J421036	RCA JACK	MTJ-032-05A-30-FE
J2203	72795925	060J421037	RCA JACK	MTJ-032-05A-32-FE
J2204	72795926	060J421030	RCA JACK	MTJ-032-05A-31-FE
J4201	72794518	060J431020	RCA JACK	MSP-213V2-432_NI_LF
J4202	72796736	060J411031	RCA JACK	MSP-213V1-432_NI_LF
J8007	72796734	060J401102	RCA JACK	MSP-251V-05NI-FE-LF
SWITCHES				
SW101	72796051	0508S11001	SWITCH (LEAF)	LSA-1144EAU
SW2201	72794688	0504101T34	SWITCH,TACT	EVQ21505R

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
SWITCHES				
SW2202	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2203	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2204	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2205	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2206	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2207	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2251	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2252	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2253	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2254	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2255	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2256	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2257	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2258	72794688	0504101T34	SWITCH,TACT	EVQ21505R
VARIABLE RESISTORS				
VR404	72795471	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR1701	72798392	V1K6314BTE	VOLUME,SEMI FIXED	NVG6TLTAB103
P.C.BOARD ASSEMBLIES				
PCB010	72783930	A5W701Q010	PCB ASS'Y	DME069B
PCB080	72783933	A5W701Q080	PCB ASS'Y	CME029B
PCB110	72783936	A5W701Q110	PCB ASS'Y	CCE024B
PCB130	72783939	A5W701Q130	PCB ASS'Y	DMF070A
PCB270	72783943	A5W701Q270	PCB ASS'Y	CEE055B
PCBDD0	72783950	A5W701QDD0	PCB ASS'Y	DEF094AC
MISCELLANEOUS				
B401	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B402	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B403	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B1701	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B1703	72794356	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B2201	72794356	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B2301	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B2302	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B2303	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B2304	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4001	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4002	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4003	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4004	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4005	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4006	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4007	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4008	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4009	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4010	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4011	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4012	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4013	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4015	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4016	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4017	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4019	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B4022	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
B5901	72796605	024HC36001	CORE,BEADS	HCB2012K-600T25
B5902	72796605	024HC36001	CORE,BEADS	HCB2012K-600T25
B8001	72794355	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B8103	72795787	0246C51024	CORE,BEADS	MMZ1608R102CT
BL001	72782870	023C00022A	COIL,BALUN	HPN-01
BT001	72783174	141U004016	BATTERY,MANGAN	MNAAA(R03)
BT002	72783174	141U004016	BATTERY,MANGAN	MNAAA(R03)
CD002	72796869	06CU011902	CORD,CONNECTOR	CU011902
CD303	72782834	06CH149006	CORD,CONNECTOR	CH149006
CD602	72796896	06CU291701	CORD,CONNECTOR	CU291701
CD603	72796894	06CU284501	CORD,CONNECTOR	CU284501
CD604	72796893	06CU282401	CORD,CONNECTOR	CU282401
CD802	72795619	WCL6844038	FLAT CABLE AWM2468 A	WG26 5C GRAY 440MM
CD803	72794460	06CH823004	CORD,CONNECTOR	CH823004
CD805	72794460	06CH823004	CORD,CONNECTOR	CH823004
CD806	72799109	06CH013601	CORD,EIS CONNECTOR	CH013601
CD807	72799108	06CH012801	CORD,EIS CONNECTOR	CH012801
CD808	72799105	06CH011202	CORD,EIS CONNECTOR	CH011202
CP001	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP101	72796765	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
CP303	72796793	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P
△CP404	72796822	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
MISCELLANEOUS				
CP601	72796797	069S240639	CONNECTOR PCB SIDE	A2001WR2-4P
CP602	72796755	067U009039	WIRE HOLDER	B2013H02-9P
CP603	72796754	067U008029	WIRE HOLDER	B2013H02-8P
CP604	72796803	069S280629	CONNECTOR PCB SIDE	A2001WV2-8P
CP803	72796816	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP805	72796816	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
△CD1702	72799247	1209415910	CORD,AC BUSH	9415910
CD1705	72799106	06CH012403	CORD,EIS CONNECTOR	CH012403
CD2251	72782835	06CH220705	CORD,CONNECTOR	CH220705
CD4002	72783896	06CH2D3301	CORD,CONNECTOR	CH2D3301
CD4501	72795877	122F061502	CORD JUMPER	2F061502
CD4503	72795878	W9L6012042	FLAT CABLE AWM2468 A	WG26 2C BLACK 120MM
CD8101	72795885	122H0C2204	CORD,JUMPER	2H0C2204
CP1702	72796754	067U008029	WIRE HOLDER	B2013H02-8P
△CP1704	72796821	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP1707	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP1708	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP2201	72796080	069S220629	CONNECTOR PCB SIDE	A2001WV2-2P
CP2301	72783177	069KYOT159	CONNECTOR PCB SIDE	LD07T2-24ND-03
CP2302	72799012	069EV53030	CONNECTOR PCB SIDE	00_6232_005_006_800+
CP2303	72799013	069EV63030	CONNECTOR PCB SIDE	00_6232_006_006_800+
CP4501	72796477	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1
CP4502	72796773	069J760599	CONNECTOR PCB SIDE	IMSA-9604S-06C
CP4503	72796748	067U002019	WIRE HOLDER	B2013H02-2P
CP5901	72783903	06CH251804	CORD,CONNECTOR	CH251804
CP5902	72796799	069S250639	CONNECTOR PCB SIDE	A2001WR2-5P
CP5903	72783757	069LAA1005	CONNECTOR PCB SIDE	C33F-004-5079A
CP602B	72796804	069S290629	CONNECTOR PCB SIDE	A2001WV2-9P
CP603B	72796803	069S280629	CONNECTOR PCB SIDE	A2001WV2-8P
CP8001	72796810	069S2D0629	CONNECTOR PCB SIDE	A2001WV2-13P
CP8002	72796776	069J7C0599	CONNECTOR PCB SIDE	IMSA-9604S-12C
CP802A	72796751	067U005049	WIRE HOLDER	B2013H02-5P
CP802B	72796751	067U005049	WIRE HOLDER	B2013H02-5P
CP8101	72799040	069J7C0589	CONNECTOR PCB SIDE	IMSA-9604S-12F
CUS011	72795887	800WFAA007	CUSHION B	
CUS012	72795888	800WFAA008	CUSHION C	
EL001	72797070	124120301A	EYE LET	XRY20X30BD
EL002	72797069	124116281A	EYE LET	XRY16X28BD
EL003	72797070	124120301A	EYE LET	XRY20X30BD
EL004	72797069	124116281A	EYE LET	XRY16X28BD
△F1701	72794493	081PC6R305	FUSE	51MS063L
△FB401	72798963	043220059F	TRANSFORMER,FLYBACK	FJN20A003_M
FH1701	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
FH1702	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
OS2201	72783677	077A031003	REMOTE RECEIVER	ROM-V3138SR
△RY1701	72798987	0560V20119	RELAY	ALKS321_M60
△SP351	72783225	070W546008	SPEAKER	MSF-18D5SB05
△SP352	72783225	070W546008	SPEAKER	MSF-18D5SB05
TM101	72783959	076D0KH050	TRANSMITTER	
△TU001	72783421	0163300022	RF UNIT	115-V-KA35ARH
△TH1701	72795546	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
△V801	72799214	098S210461	CRT W/DY	A51QDJ420X58
X101	72796062	100DA32R01	CRYSTAL	DT-26
X102	72783679	100GT01408	CRYSTAL	B14318C008
X601	72797006	100CT3R532	CRYSTAL	HC-49/U-S
X4001	72783182	100GT02720	CRYSTAL	B27000C005
X4501	72796064	100CT3R502	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN